

WILLISON AUTOMATIC COUPLERS

Automatically couple over wide gathering range

NATIONAL CASTINGS CO

Cleveland, Ohio



CAR COUPLING.

1,201,666.

3 SHEETS—SHEET 1.

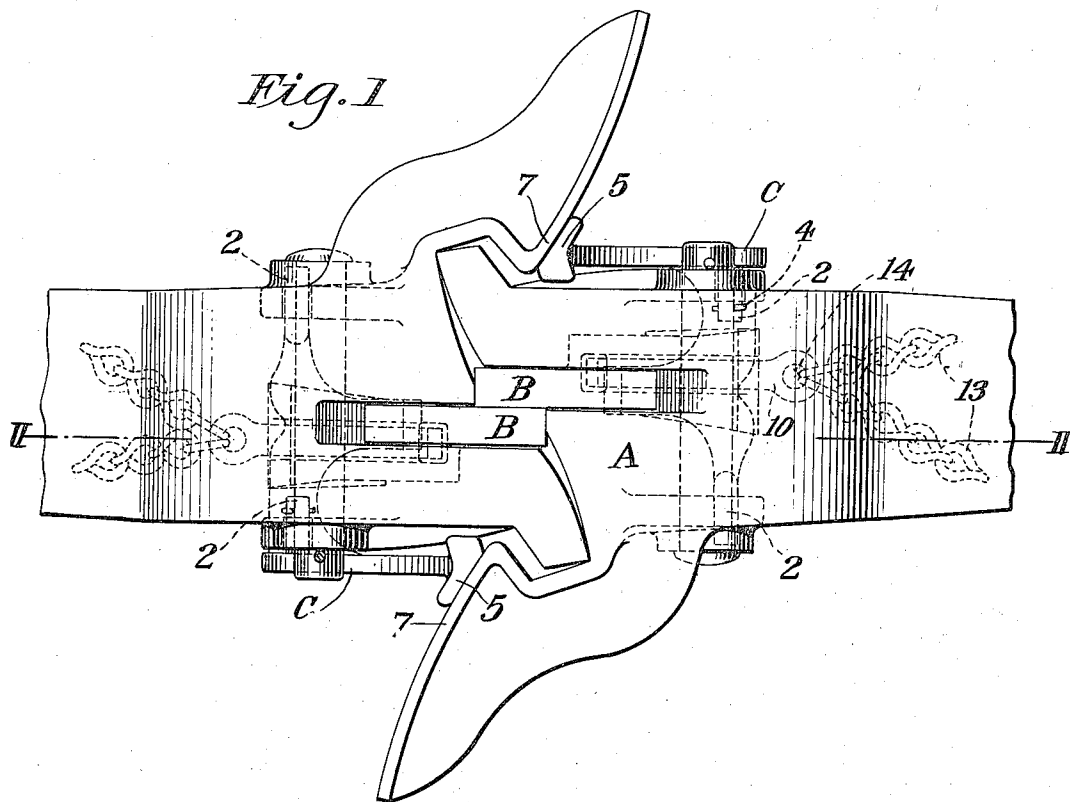
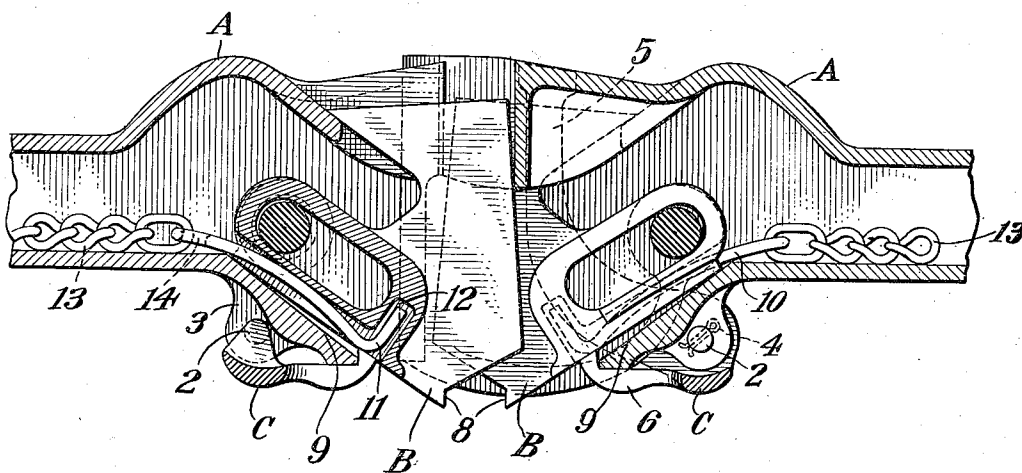


Fig. 2



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CAR COUPLING.

APPLICATION FILED DEC. 31, 1913. RENEWED AUG. 10, 1916.

1,201,666.

Patented Oct. 17, 1916.

3 SHEETS—SHEET 2.

Fig. 3

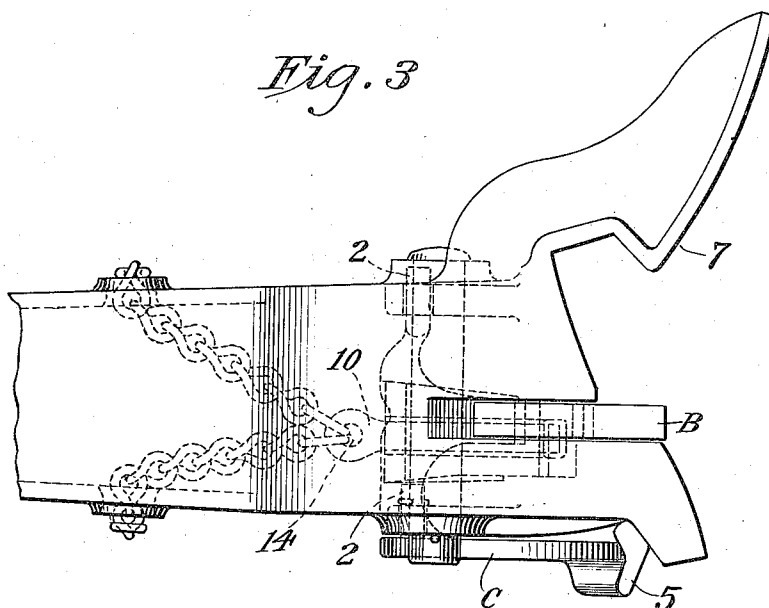
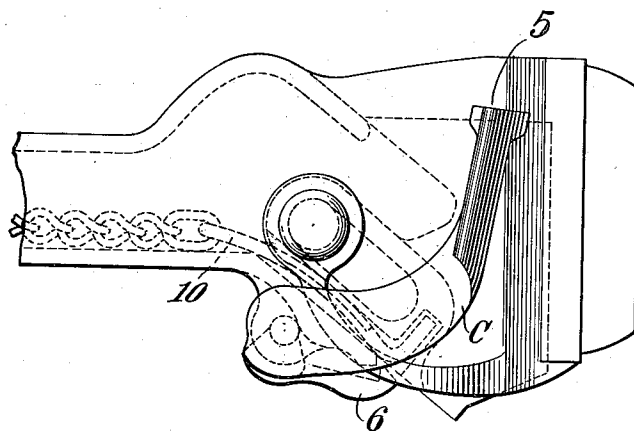


Fig. 4



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CAR COUPLING.

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1,201,666.

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3 SHEETS—SHEET 3.

Fig. 6

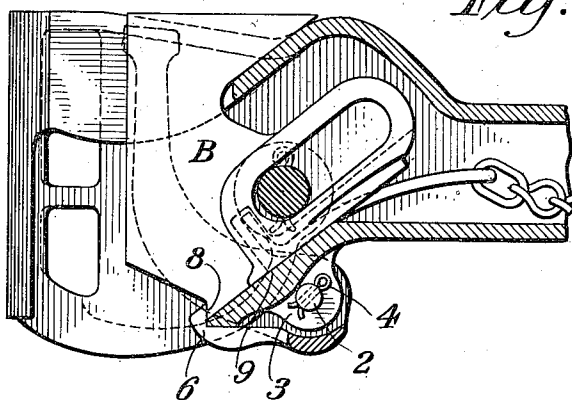


Fig. 5

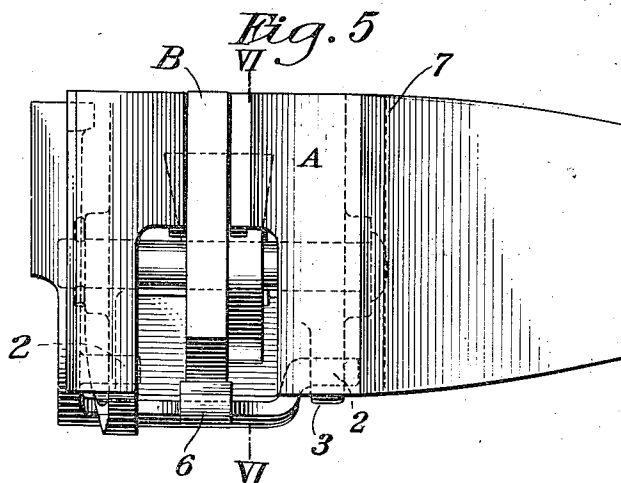


Fig. 7

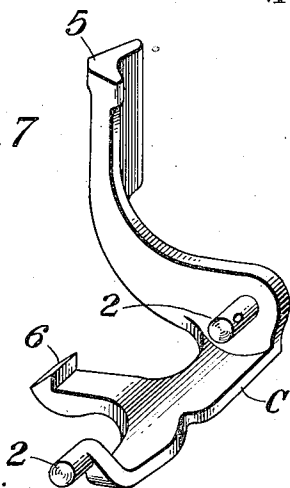
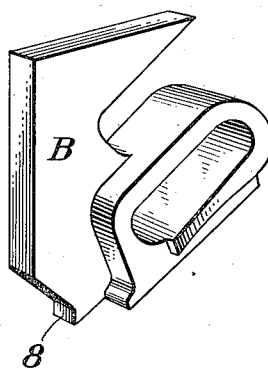


Fig. 8



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UNITED STATES PATENT OFFICE.

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CAR-COUPLING.

1,201,666.

Specification of Letters Patent.

Patented Oct. 17, 1916.

Application filed December 31, 1913, Serial No. 809,601. Renewed August 10, 1916. Serial No. 114,293.

To all whom it may concern:

Be it known that I, JOHN WILLISON, a subject of the King of Great Britain, and a resident of Derby, county of Derby, Eng-

land, have invented new and useful Improvements in Car-Couplings, of which the following is a specification, reference being had to the accompanying drawings, in which—

Figure 1 is a plan of a pair of interlocked couplers embodying my improvements; Fig. 2 is a section on lines II—II of Fig. 1; Fig. 3 is a plan of a coupler with the parts in lowermost position; Fig. 4 is an elevation with the parts in lowermost position; Fig. 5 is a front elevation with the parts in lock-set position; Fig. 6 is a section on lines VI—VI of Fig. 5; Fig. 7 is a detail of the lock-setting mechanism, and Fig. 8 is a detail of the lock.

My invention relates to improvements in car couplers of the type shown in my co-pending application, Serial No. 114,292, filed August 10, 1916, and consists in mechanism for operating and lock-setting the lock.

Referring to the drawings, A is the coupler-head, B the lock and C the lock-set member. The lock-set member C has trunnions 2 by which it is pivoted to the coupler-head in suitable bearings 3 and may be held therein by a cotter pin 4, as shown. Projecting upwardly at one side of the lock-set member C is an actuating arm 5, and extending forwardly from its central portion is a lock-set ledge or shelf 6. When the lock-set member C is mounted on its trunnions 2 in the bearings 3, it is adapted to have a limited pivotal movement upon said bearings from a position in which the actuating arm 5 is upright (as is shown in dotted lines in Figs. 2 and 6) to the position in which the arm 5 is inclined somewhat forwardly (as is shown in full lines in Figs. 3 and 4). When the coupler is not in engagement with a corresponding coupler on an opposing car, the lock-set member C will by gravity normally assume the position shown in Fig. 4, and when two coupler-heads are interlocked, the engagement of the face 7 of the opposing coupler with the actuating arm 5 compels it to assume the position shown in Fig. 6.

At the lower end of the incline on the bottom of the lock B is located a stop-shoulder 8, which is adapted to cooperate with the

shelf 6 on the lock-set member C, as is shown in Figs. 5 and 6. When the arm 5 of the member C is in the inclined position shown in Figs. 3 and 4, the lock-set shelf 6 is dropped down out of the way to such an extent that it forms no obstruction to the free movement of the lock down the incline 9 on the coupler-head, so that with the arm 5 in its forwardly-inclined position, the lock will slide freely to its lowermost or locked position along the incline 9 of the coupler-head. When, however, the couplers are interlocked the face 7 of the opposing coupler forces the actuating arm 5 to a substantially vertical position and rotates the lock-set member C about its trunnions so that the shelf 6 rises into the position shown in Fig. 2, in which it forms an obstruction or stop at the lower end of the incline 9 of the coupler-head. When, subsequently, as in the normal operation of unlocking, the lock B is raised, this ledge or shelf 6 will engage the shoulder or stop 8 on the lock and will thus prevent a return of the lock down the incline into the lowermost or locking position. The lock will thereafter be held supported by the movable shelf 6 until the interlocked couplers disengage or draw apart and permit the slight amount of rotation of the member C which is necessary to retract its lock-set portion 6 from the position of Figs. 5 and 6 into that of Figs. 3 and 4, after which the lock will drop into lowermost position. The lock normally remains in lowermost position both prior to and after the making of a coupler engagement, although, if desired, the parts may be placed in lock-set position.

The lock B is preferably actuated by the lifting hook 10 which underlies the lock and the end 11 of which fits into the recess 12 of the lock. The hook 10 is actuated by a chain 13, which is attached to the eye 14 in the hook and which may be passed laterally through suitable apertures in the shank of the coupler.

It is obvious that various modifications may be made in the mechanism which I have shown and described herein without departing from my invention.

Having now described the nature of my said invention and the best means I know of carrying the same into practical effect, I claim:—

1. In a car coupler of the vertical plane

type having in combination a coupler head, a gravity lock and a lock-set device, said lock-set device comprising a gravity controlled member fitted to the coupler head
5 and adapted to assume a supporting and a non-supporting relation to the lock, said member being held in supporting position by contact with an opposing coupler head.

2. In a car coupler of the vertical plane
10 type comprising a gravity-actuated lock, a longitudinally extending recess in the coupler head, and a lock set member, said member being in form a bell crank lever pivoted to the coupler, one of the arms of the lever
15 lying in the path of the coupler head and the other of said arms being adapted to be rotated into position to bear on the bottom

of the lock and to support it in lock-set position.

3. In a car coupler of the vertical plane 20 type, a coupler head having a cavity therein, an inclined surface at the rear side of said cavity, a gravity actuated lock mounted upon said surface, a longitudinally disposed recess of L-shape in said lock and a hook 25 shaped lifter seated in said recess and engaging the lock, the said lifter being adapted to be retracted rearwardly to actuate the lock rearwardly and upwardly on said inclined surface.

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AUTOMATIC CAR COUPLING.

APPLICATION FILED DEC. 31, 1913. RENEWED AUG. 10, 1916.

1,201,667.

Patented Oct. 17, 1916.

4 SHEETS—SHEET 1.

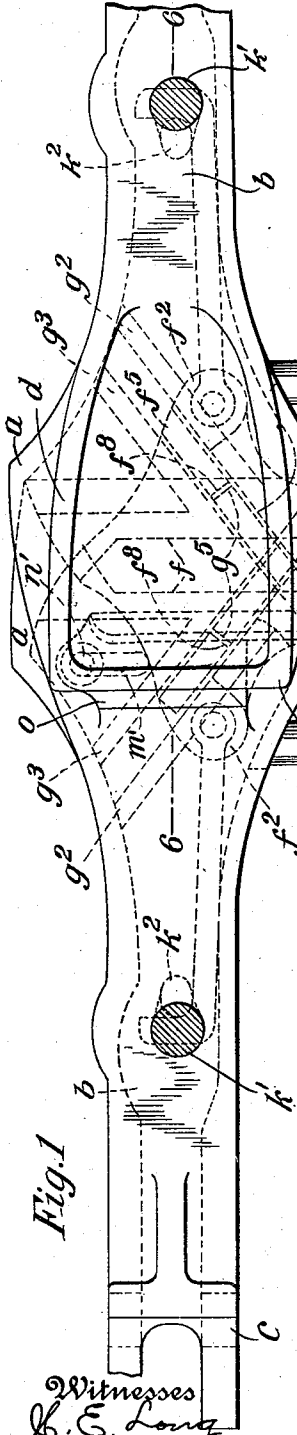


Fig. 1

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L. E. Long
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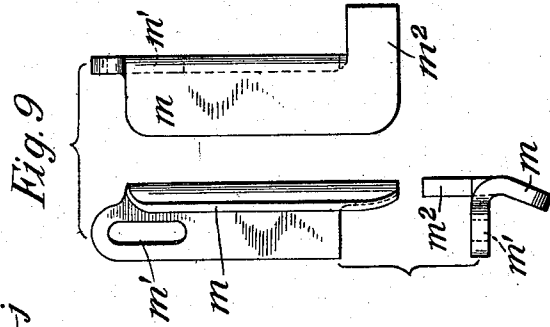


Fig. 9

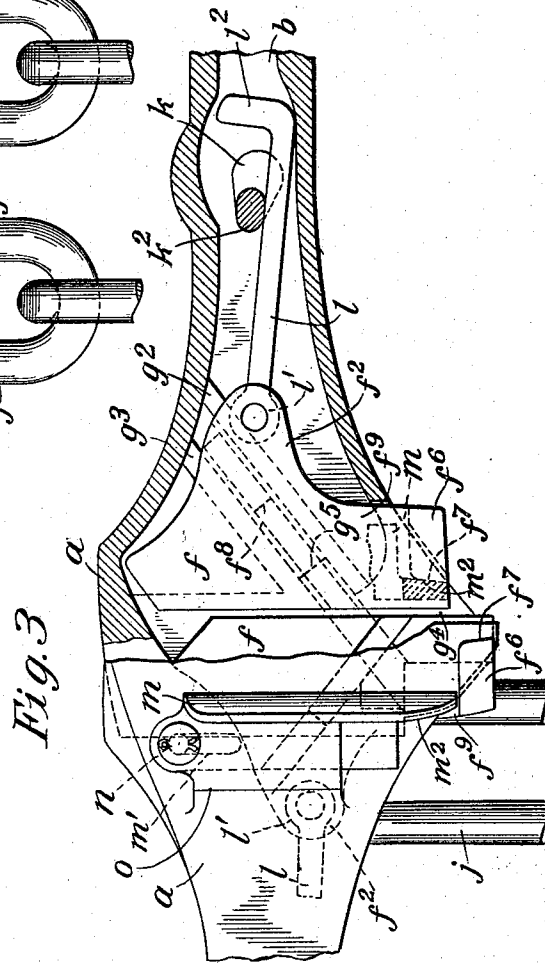
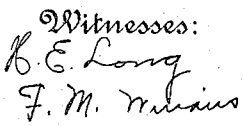


Fig. 3

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Patented Oct. 17, 1916.
4 SHEETS—SHEET 2.



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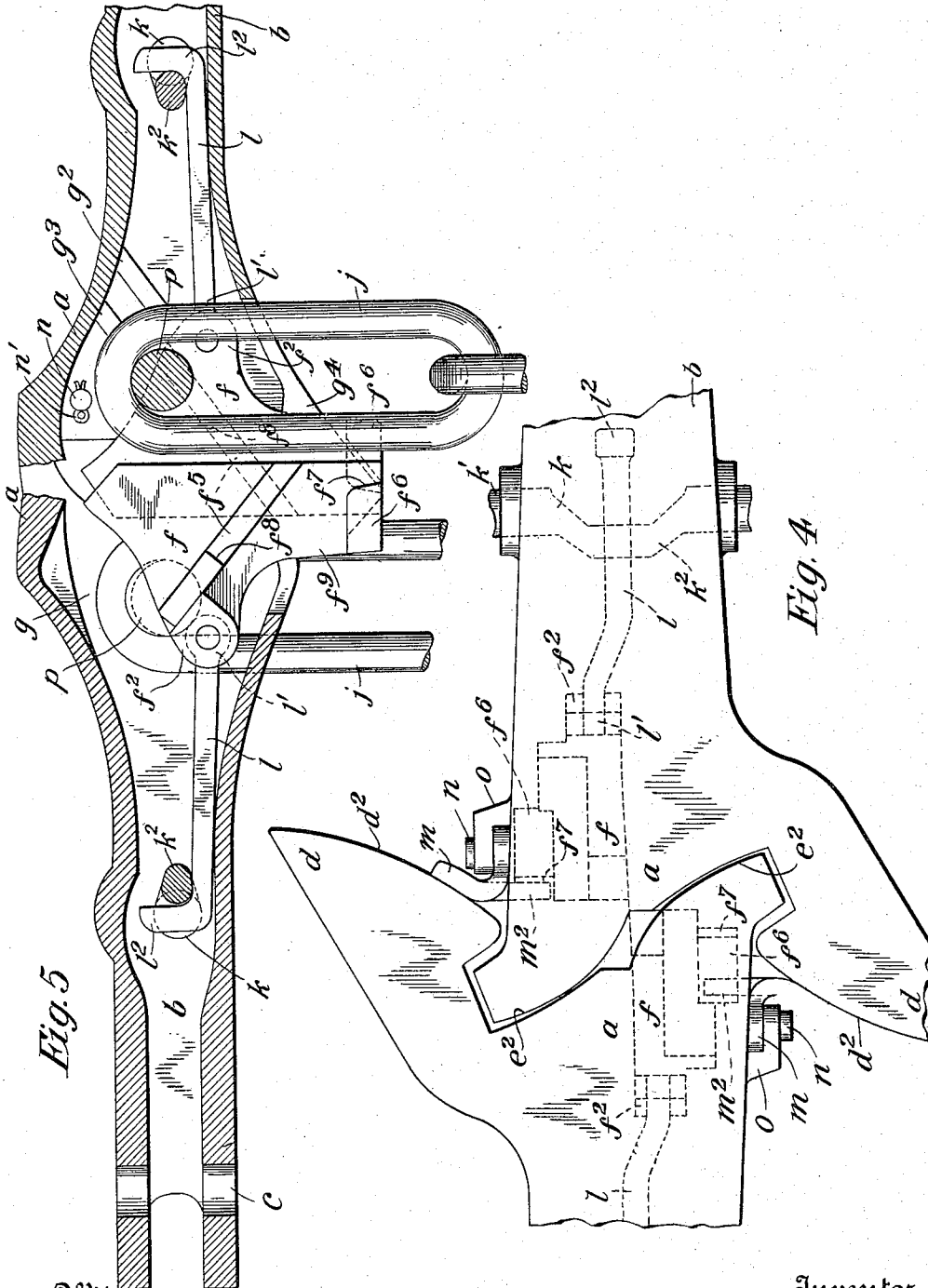
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AUTOMATIC CAR COUPLING.

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1,201,667.

Patented Oct. 17, 1916.

4 SHEETS—SHEET 3.



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APPLICATION FILED DEC. 31, 1913. RENEWED AUG. 10, 1916.

Patented Oct. 17, 1916.



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UNITED STATES PATENT OFFICE.

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AUTOMATIC CAR-COUPLING.

1,201,667.

Specification of Letters Patent.

Patented Oct. 17, 1916.

Application filed December 31, 1913, Serial No. 809,602. Renewed August 10, 1916. Serial No. 114,294.

To all whom it may concern:

Be it known that I, JOHN WILLISON, a subject of the King of Great Britain, and a resident of Derby, county of Derby, England, have invented new and useful Improvements in Automatic Car-Couplings, of which the following is a specification.

This invention consists in improvements to automatic couplers for railway vehicles as described in my co-pending application Serial No. 114,292, filed August 10, 1916, and wherein each coupler head is free to move laterally but may be locked in coupled condition with another similar coupler head by means of a pair of gravity locking blocks, mounted one in each coupler head in recesses provided for the purpose, the blocks overlapping each other when in locking position and being slidable on inclined surfaces so that they can be moved out of engagement with each other to permit the relative lateral movements necessary in coupling and uncoupling operations.

The improvements have for one of their objects improved means for shifting a locking block along its inclined surface or surfaces into a retracted or unlocking position and for retaining it there so that the coupler heads on two vehicles can, during shunting operations, engage each other without becoming locked together.

Another object of the improvements is to provide means whereby a locking block, when thus shifted into the retracted position may be retained in that position, after the above said retaining means has been operated in a manner that it ceases to retain the block, as long as the coupler head carrying the block remains in engagement with another coupler head and may become free to return automatically to the forward or locking position as soon as the two heads move apart and become disengaged.

A further object is to form the locking blocks in a manner that they will be better able to transmit the lateral stresses that may come upon them and be more efficiently guided during their sliding movements.

The invention will be described with reference to the accompanying drawings in which—

Figures 1 and 2 are respectively side elevation and a plan showing the couplers locked in the engaged position. Figs. 3 and

4 are respectively an elevation partly in section and a plan showing the two couplers in engaged position but unlocked, the locking block of one of the couplers being retained in retracted or inoperative condition by an automatic lock set device. Fig. 5 is a longitudinal vertical section on line 5—5 of Fig. 2. Fig. 6 is a part sectional plan on line 6—6 of Fig. 1. Fig. 7 is a side elevation of a coupler head disengaged showing an intermediate position of the locking block, Fig. 8 shows a plan, side and end views of a locking block, and Fig. 9 shows corresponding views of a lock set device.

The parts of the improved coupler corresponding to those of the coupler described and illustrated in the above cited application, have similar reference letters applied to them in the accompanying drawings and need not be again described.

The means for retracting the locking blocks comprises according to this invention, a spindle k rotatably mounted in the walls of the hollow shank b of the coupler; the ends k' of the spindle project at each side of the shank and are suitably formed for the attachment of a handle or other convenient actuating member. The central portion k^2 of the spindle is cranked or given a cam form for a purpose hereinafter explained. Arranged below the spindle k is a rod or bar l adapted to slide lengthwise and if necessary between suitable guides, upon the bottom wall of the shank. The outer end l' of this rod is pivotally connected with the tail f^2 of the locking block f ; at the inner end there is an upturned part l^2 . When the two members of the retracting device are assembled and the locking block is in its normal forward or locking position, the cranked portion k^2 will be outwardly directed lying upon the upper surface of the rod l . If the spindle k be now turned so that the cranked portion k^2 rotates upwardly and rearwardly, this portion k^2 will first move into engagement with the part l^2 and in further rotary movement will push the part l^2 with the rod l rearwardly. The block by reason of its engagement with the arm l' will be thus retracted, with its lateral shelf-like projection f^5 sliding up between the inclined guiding surfaces g^2 , g^3 , formed on one of the inner side walls of the coupler head.

In order that the cranked portion k^2 may pass from its forwardly directed position to its extreme rearwardly directed position and vice versa the spindle has to be turned for each such movement through an angle of 180°. The two extreme positions of the cranked portion will be in the plane of the front and rear dead centers thereof, so that when the cranked portion has been moved into its rearward position and the locking block thereby retracted the latter will be retained in the inoperative position by the cranked portion, lying in the plane of its dead center until such time as it is turned back and lifted out of the rearwardly directed and dead center position whereupon the block, unless otherwise retained as explained below becomes free to slide forward along the surface g^2 into the locking position.

In order that a lock may be still held in unlocking or retracted position, while two coupler heads remain in engagement after the spindle has been turned back into the forwardly directed position and the lock may yet be free to assume its normal locking position so that its coupler head becomes "armed" as soon as the coupler ceases to be in engagement with the other coupler head, an automatic lock-set device is provided on the coupler head. This device comprises a member m slidably and pivotally mounted on the coupler head wall by means of its slot m' and the pin n suitably secured in said wall, as for instance by a cotter pin n' .

The lock set member m is retained in position against that wall by a suitably formed part o projecting from the wall, and by reason of the pin and slot connection the member m is capable of both a pivotal and an upward sliding movement. As long as a coupler is out of engagement with another, its member m will remain in its lowest position suspended from its pin n . If the rod l be operated so that the block f correlated therewith is withdrawn rearwardly to its full extent, that is to its dead center position; the laterally projecting part or rib f^6 of the block will be caused to pass beneath and thereby raise the member m , (Fig. 7), which, as soon as the part f^6 has passed sufficiently to the rear to be clear of it, will drop to a greater or less extent in front of the part f^6 , thus preventing the block returning to its locking or operative position as long as the member m remains in engagement with the face d^2 of an opposing coupler. As soon as this opposing coupler moves away, or if there be no opposing coupler the lock set member m is free to swing forward under the pressure imparted to it by the block, the cooperating faces m^2 and f^7 being suitably formed to facilitate such action.

The locking block can thus be held in

retracted or unlocking position by the lock set member m so long as two coupler heads are in engagement, and in such circumstances the rod l is no longer needed for retaining the block in this condition and can be returned to its forwardly directed position. The lock set device m does not, however, come into operation when the coupler head associated with it merely engages another coupler head, when the heads of two couplers engage their locking blocks f mutually push each other back sufficiently to allow the lateral movement of the heads on the buffing contour faces.

In the coupler shown in my above cited application, the locking block was guided in its to and fro sliding movements by means of the recess g formed at the top of the coupler head between its two jaws, while lateral strains coming on the block were transmitted to the walls of this recess. The locking block projection f^6 is provided with a slot or guideway f^7 for the reception of the part g^4 depending from the coupler head and carrying the inclined surfaces g^2 , g^3 . The engagement of the slot f^7 with the part g^4 will prevent any lateral movement of the locking block beyond what is purposely allowed for the easy working of the parts, and lateral stresses coming on the block are transmitted to both the portion g^4 and upper part of the side wall of the coupler head, while the guide surfaces g^2 , g^3 prevent the block rising vertically.

A coupling chain j removably carried by a lug p projecting from the wall of the recess g may be provided for use when the improved automatic coupler is used with a vehicle having an ordinary draw-hook coupling.

When assembling the several parts of the improved coupling, the coupling chain is passed sidewise on to the lug p before the locking block is introduced into the recess, and the locking block when introduced prevents removal of said chain from the lug.

The lug p may be dished longitudinally or otherwise suitably shaped so as to retain a chain g , suspended from it, out of contact with the side of the locking block. The free end of the lug may serve not only as a guide for the block in its to and fro sliding movements, but also to retain the block on its bearings g^2 , g^3 .

Having now described the nature of my said invention and the best means I know of carrying the same into practical effect, I claim:—

1. In a car coupler of the vertical plane type a gravity actuated lock, the lock having a lateral projection thereon, a lock-setting mechanism comprising a member having a pivoted engagement with the coupler head and a shoulder extending into the path of movement of the projection on the lock,

the said lock-setting device being adapted to be held in the path of the projection on the lock by contact with the opposing coupler.

2. In a car coupler of the vertical plane type a gravity-actuated lock having a lateral projection thereon, and a lock-setting device adapted to be held in the path of the projection on the lock by contact with the opposing coupler head.

3. In a car coupler of the vertical plane type a gravity-actuated lock having a lateral projection thereon, a lock-setting device normally lying in the path of said projection and being adapted to be brought into operation by contact with the opposing coupler head, the movement of the lock being normally unrestrained by the lock-setting device.

4. In a car coupler of the vertical plane type a gravity-actuated lock, a lock setting mechanism normally lying in the path of a portion of the lock, the said lock-setting mechanism being pivotally attached to the coupler head and being free to slide vertically to permit the operation of the lock during the unlocking movement.

5. In a car coupler of the vertical plane

type, a coupler head having a cavity therein, a gravity-actuated lock operating in said cavity, a lifter engaging said lock, said lifter being secured to and operated by a cam spindle seated in the shank of the coupler.

6. In a car coupler of the vertical plane type a coupler head adapted for lateral movement having a cavity therein, a locking block mounted in guides in said cavity, said locking block being held in its guides by a boss extending laterally from a wall of the cavity, the said boss being adapted to support a link of a coupling chain.

7. In a car coupler of the vertical plane type a coupler having a cavity therein, a gravity-actuated lock operating in said cavity, a boss adapted to bear against one side of said lock and being also adapted for the suspension of a coupling chain therefrom, the boss being dish-shaped to hold the coupling chain out of contact with the lock.

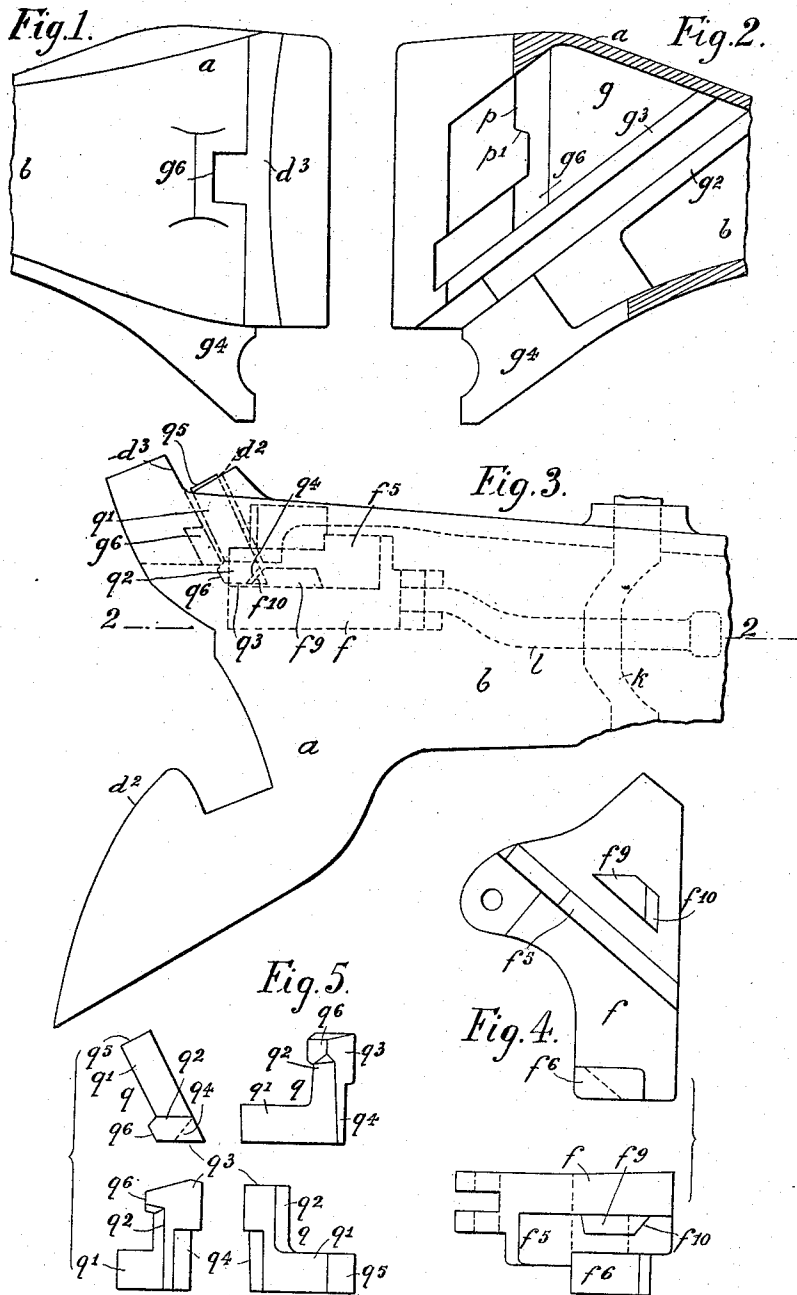
JOHN WILLISON.

Witnesses:

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."

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 AUTOMATIC CAR COUPLING.
 APPLICATION FILED FEB. 21, 1914. RENEWED AUG. 10, 1916.
 1,201,669. Patented Oct. 17, 1916.



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AUTOMATIC CAR-COUPLING.

1,201,669.

Specification of Letters Patent.

Patented Oct. 17, 1916.

Application filed February 21, 1914, Serial No. 820,175. Renewed August 10, 1916. Serial No. 114,296.

To all whom it may concern:

Be it known that I, JOHN WILLISON, a subject of the King of Great Britain, residing in Derby, England, and whose post-office address is 123 Palmerston street, Derby, in the county of Derby, England, have invented certain new and useful Improvements in Automatic Car-Couplings, of which the following is a specification.

This invention consists in improvements or modifications in the car couplers described in the specification to my United States patent application No. 114,294, which are of the type wherein each vertically pivoted coupler head is free to move laterally but may be locked in coupled condition with another similar coupler head by means of a pair of gravity locking blocks mounted one in each coupler head in recesses provided for the purpose, the blocks overlapping each other when in locking position and being adapted to slide on inclined surfaces, so that they can be moved out of engagement with each other to permit the relative lateral movements necessary for effecting the coupling and uncoupling operations.

I have already proposed, as explained in my co-pending applications Nos. 114,293, 114,294 and 114,295 to improve car couplers of the above type, by providing them with means adapted not only to shift the locking block along its inclined surfaces into a retracted or unlocked position, but also to retain it there so that the coupler heads on two vehicles can, during shunting operations, engage each other without becoming coupled together. I have also proposed in these specifications to provide such couplers with lock set devices by means of which a locking block shifted into the retracted or unlocked position is automatically retained in that position as long as the associated coupler head is in engagement with a similar coupler head, even though the locking block be released by the retracting device, but the locking block becomes free to return automatically to the forward or locked position as soon as the two heads move apart and become disengaged.

The present invention consists in an automatic lock set device which, though performing the same functions as those just referred to, has an improved form and manner of operation.

Compared with my former lock-set de-

vices the improved device possesses the following advantages:—It consists of a single member and is therefore cheaper to make than a device with a number of parts or members; it is contained almost entirely within the coupler head and consequently is less liable to injury from weather and externally-applied blows; it is more positive in action in extreme relative vertical positions of two engaging coupler heads, that is to say should the difference in level of two engaging coupler heads, through some cause or other, amount to even more than half the depth of a head the device will still perform its duty efficiently; by reason of the part of the lock-set device that is operated by an opposing coupler head having a position corresponding with the mid-depth of its own coupler head or nearly so; and it retains the locking block later, that is for a longer period in its lock-set position, while the two opposing couplers are separating from each other, which is due to the movement of the device, when swept out of engagement with or brushed aside by the locking block, being in an obliquely forward transverse direction, so that the device follows the direction of movement of the guard arm face of the opposing coupler against which face the end of the device bears. The return movement of the device into engagement with the locking block takes place in the reverse direction, that is in an obliquely rearward transverse direction, and is affected by the inwardly extending nose of the guard arm face of the opposing coupler.

The invention will be described with reference to the accompanying drawings, which show a coupler of the kind referred to and more particularly described and illustrated in my patent application No. 114,292 having the present invention applied.

In the drawings Figure 1 is a part elevation of a coupler head; Fig. 2 is a longitudinal section on line 2—2 and Fig. 3 is a part plan of a coupler, part of an engaging coupler head being shown in broken lines and in positions that it successively assumes in passing into or out of engagement, Fig. 4 represents an elevation and plan of a locking block, and Fig. 5 shows a plan, side and end views of a lock-set piece.

The parts of the coupler and head in the accompanying drawings which correspond in substantial degree to parts described and

illustrated in the above cited specifications, are denoted herein by corresponding reference letters. The locking block f , the parts k and l of the block retracting device in the coupler shank b and the coupler head a with its guiding surfaces g^2 , g^3 are substantially the same as those referred to in those specifications, the interior recess in the coupler head being modified merely for the reception of the improved lock-set piece which is herein denoted by the reference letter q . This lock-set piece comprises a body portion q' and an upwardly projecting head portion q^2 which serves for retaining the locking block in the unlocked position as explained below. When assembled in the coupler head, the body q' of the lock-set piece is housed or mounted in a laterally and outwardly directed slotway or aperture g^6 in the wall of the recess g in the head and in the manner to be capable of sliding to and fro therein, and in a direction that is obliquely across the coupler head, while the head portion q^2 is accommodated within a suitably formed recess or sinking p formed in or on the said wall, with its face q^4 in parallel relation but normally out of contact with the adjacent side of the locking block f and a projection f^9 thereon. On the upper part of the head q^2 is a forwardly projecting guide q^6 which is adapted to rest on a corresponding ledge p' adjacent to the recess p , and serves to support the lockset piece during its sliding movements. The face q^4 of the head portion q^2 is beveled off to a convenient angle and in such a manner that if the piece q be mounted in the slotway g^6 the pressure be applied normally to the face q^4 , the resultant force on the piece q , due to this pressure and the resistance of the opposite side wall of the slotway g^3 , will tend to force the piece q in a direction longitudinal of the slotway. The length of the body q' is such that its end q^5 normally projects beyond the outer wall of the coupler head to a desired extent, while the head portion q^2 is out of contact with the locking block.

The locking block is provided not only with the slotted projecting rib f^6 which engages in known manner with the dependent part g^4 of the coupler head in order to guide the locking block in its forward and backward movements, but also with the projection f^9 which, while the block is being retracted, will under certain conditions described below, pass beneath the head q^2 and thereby lift the head portion q^2 and cause the lock-set piece to tilt or turn on the lower outer edge of its slotway g^6 and in a direction laterally of the coupler head. As soon as the projection f^9 passes rearwardly of or beyond the end of the head q^2 during a retracting operation, the head q^2 if it has been thus lifted will, under the action of gravity, fall in front of the projection f^9 and thereby

serve to retain the block in the retracted position.

As the lock-set piece q is normally out of engagement or contact with the locking block this latter can accordingly be pushed backward sliding on its guiding surfaces g^2 , g^3 and move forward again into the locked position, without hindrance from the lock-set piece. When however, pressure is applied to its end q^5 then the body q' will be caused to slide inwardly within the slotway or bearing g^6 so that the head portion q^2 moves into contact, or nearly so, with the adjacent side of the locking block. If the locking block be in its locking down position and the piece q be pushed back, then the heel of the body q' will assume a position in rear of the projection f^9 . If the locking block be now retracted into the unlocking position the projection f^9 , being suitably shaped for the purpose, will pass below moving lengthwise of the head q^2 and thereby lifting the head q^2 as described above. As the head is lifted, the lock-set piece will tilt, turning on the lower outer edge of the slotway.

As stated above, the end q^5 of the body normally projects beyond the outer face of its coupler head, but when this coupler head engages another coupler head, inwardly projecting nose or face d^2 of the guard arm of the opposing coupler head will engage the end q^5 and as the two coupler heads pass into final interlocking engagement the end q^5 of the part q' will be pressed inwardly in a rearwardly and obliquely transverse direction, so that the head q^2 comes into close proximity or contact with the side of the locking block, as explained above. If the locking block be now retracted from the locking down position by the device provided for the purpose the projection f^9 thereon first lifts the head portion q^2 and then passes beyond it, whereupon the head q^2 by reason of its weight drops again and in front of the projection f^9 . The locking block will be retained in the retracted position by the engagement of the projection with the head of the lock-set piece after the retracting device has itself been turned back to the position corresponding to the locking down position of the locking block, and until such time as the two coupler heads move out of engagement and thereby leave the lock-set piece free to slide outwardly again in its bearing g^6 which it will do by reason of the pressure applied to the end q^4 by the projection f^9 of the locking block as the block automatically returns to its locking position under the action of gravity. To facilitate this brushing aside of the lock-set piece, the slope or bevel of the face f^{10} of the projection f^9 should correspond to that given to the face or end q^4 on the lock-set piece.

If the axis of the slotway g^6 be parallel with the face d^3 of the coupler head, then the sliding movements of the body portion of the lock-set piece in a coupler head will
 5 be in directions corresponding with those in which the guard arm of an opposing coupler head is at the moment moving into or out of engagement with the first said coupler head and the end q^5 . The guide on the head of
 10 the lock-set piece, in addition to supporting the lock-set piece during its sliding movement, serves to retain the piece within the head of the coupler. The head is sufficiently weighted to drop or move automatically into
 15 a lockset position in front of the retracted locking block after it has been lifted or tilted by said block during the retracting operation.

Having thus described the nature of the
 20 said invention and the best means I know of carrying the same into practical effect, I claim:—

1. A car coupler of the vertical plane type comprising a coupler head having a
 25 cavity therein, a gravity actuated lock mounted in said cavity, a projection on the lock, a lock-setting device mounted on the coupler head adapted in one position to be moved into a supporting engagement with
 30 the projection on the lock by contact with an opposing coupler head, and to be forced out of such engagement with the lock by the gravity actuated movement of the lock as the couplers draw apart.

35 2. A car coupler of the vertical plane type comprising a coupler head having a cavity therein, a gravity actuated lock mounted in said cavity, and a lock-setting device mounted in a recess in one jaw of the coupler head,
 40 the said device being adapted to be driven into supporting engagement with the lock for lock-setting by contact with an opposing

coupler head and to be forced out of said engagement by movement of the lock.

3. A coupler of the vertical plane type
 45 having in combination a coupler head, a gravity-actuated lock, and a lock-set device, said lock being adapted to overlap and abut against the lock of a similar coupler to hold
 50 said couplers in interlocked position, the lock-set device comprising a member movably mounted on the coupler head and capable of assuming a supporting and a non-supporting position with the lock, said member
 55 being held in supporting position by contact with a similar coupler and being adapted to be shifted to non-supporting position by movement of the lock.

4. A coupler of the vertical plane type having in combination, a coupler head, a
 60 gravity-actuated lock, and a lock-set device, said head having projections adapted to interlock with corresponding projections on a similar coupler by a relative lateral movement
 65 between said couplers, said lock being movable into overlapping engagement with a corresponding lock on a similar coupler to hold the couplers against relative lateral
 70 movement, and said lock-set device comprising a member having a floating bearing on the coupler-head, and adapted to assume
 75 a supporting and a non-supporting relation with said lock, said member being held in its supporting relation by contact with an opposing coupler head and being forced out
 of supporting relation by the gravity-actuated movement of the lock.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOHN WILLISON.

Witnesses:

JOSEPH MILLARD,

WALTER J. SKERTEN.

Jan. 18, 1927.

1,614,515

J. WILLISON

CAR COUPLER AND CONTOUR THEREFOR

Original Filed Feb. 16, 1923

Fig. 1.

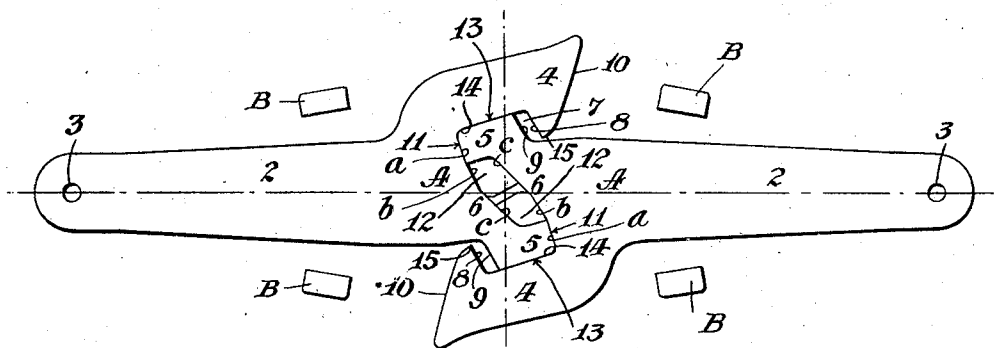


Fig. 2.

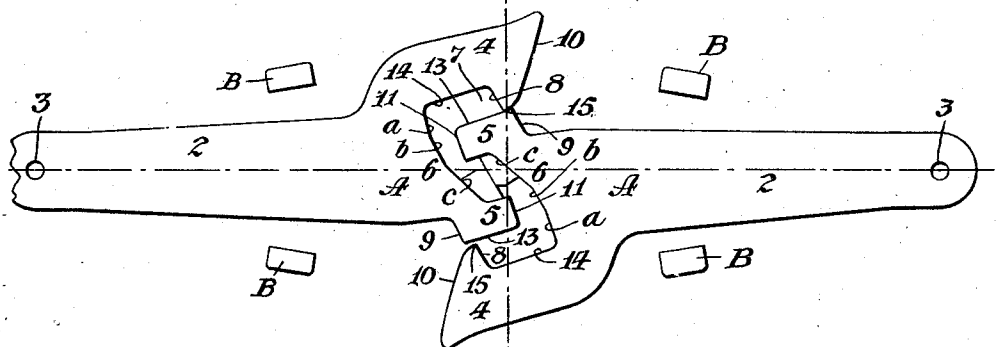
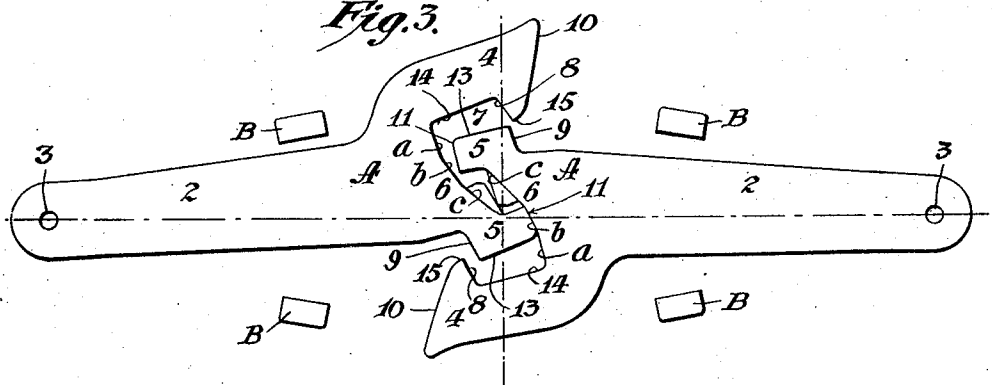


Fig. 3.



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John Willison

BY

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UNITED STATES PATENT OFFICE.

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CORPORATION OF OHIO.

CAR COUPLER AND CONTOUR THEREFOR.

Application filed February 16, 1923, Serial No. 619,363. Renewed August 5, 1926.

Fig. 1 is a plan of a pair of coupler heads in locked position embodying my invention; Fig. 2 is a plan showing a common position of the coupler heads as they are moving into coupled position; and Fig. 3 is a plan showing the coupler heads during the coupling operation, with one of them in a rather extreme angled position.

My invention relates to automatic couplers of the type shown in my Patent No. 1,201,665, dated October 17, 1916, in which the stresses of buffing and draft are transmitted directly from one coupler head to another without the interposition of movable parts such as knuckles, and in which the locking mechanism is designed primarily to keep the opposing couplers in interlocked position. My invention is particularly directed to the form of the outline or contour of the coupler for the purpose of increasing the strength of its buffing jaw, of rendering coupling easier either on a straight track or while the cars are on curves, and of decreasing the liability of the couplers to fail to couple at all. My invention also consists in the various other features in my improved coupler and contour which I shall hereinafter describe and claim.

Referring to the drawings, the coupler head A has a rearwardly extending shank 2 provided at its rear end with suitable means for flexibly attaching it to the car framing (not shown), such as the vertical pivot 3, to provide for sufficient lateral angling between the limiting stops B on the car to permit the engagement or disengagement of interlocking projections on the opposing coupler, which is a necessary incident to coupling and uncoupling with couplers of my improved type. The coupler head A has a pair of jaws 4 and 5, the left jaw 4 being known as the gathering or guiding jaw and the right jaw 5 as the buffing jaw. These jaws 4 and 5 have vertically disposed buffing and pulling faces to permit couplers of varying heights and positions on the cars to intercouple. Connecting the jaws 4 and 5 is a guiding and buffing face 6 arranged on axes inclined laterally to the line of draft, to which I will later refer. Each jaw 4 has a lateral recess 7 to receive the complementary jaw 5 on the opposing coupler, and its pulling face 8 engages a complementary face 9 on the jaw 5 of the opposing coupler. In coupling, the

laterally inclined faces 10 and 11 on one coupler cooperate with the faces 10 and 11 and the intermediate face 6 on the other coupler to swing the couplers laterally to interlock their jaws 4 and 5. In coupled position pulling stresses are transmitted through the pulling faces 8 and 9, and the locks 12, while in buffing they are transmitted through faces 11 and 13 of the buffing jaws and the faces 6 and 14 at the rear corner of the recess 7.

Each lock 12, shown in locked position in Fig. 1 hereof, has its axis inclined laterally to the line of draft and is adapted to reciprocate into and out of locked position by the manipulation of its operating mechanism or by the action of the opposing coupler head, as is described in my pending application Serial No. 442,359, filed February 4, 1921.

In operating the coupler of my Patent No. 1,201,665 it has been found at times that it is impossible to couple automatically when the opposing couplers are in positions similar to those shown in Fig. 3. Under such conditions the inward face of the guiding jaw strikes the outer face of the buffing jaw of the opposing coupler and thus keeps the couplers from reaching coupled position. Even when these prior couplers are displaced laterally by but a slight amount—for instance, into a position similar to that shown in Fig. 2—the interference is sufficient to necessitate the couplers being brought together with considerable force in order to effect coupling.

I overcome these difficulties in my improved contour by extending the inclined face 10 of the gathering jaw substantially to its intersection at 15 with the pulling face 8 of that jaw; by increasing the depth of the recess 7 in jaw 4; by increasing the length of the jaw 5 so that its longitudinal axis is greater than its transverse axis; by increased clearance in the recess so as to provide ample room for the jaw 5 to enter the recess 7 without striking the point 15; and by forming the intermediate buffing face 6 between the jaws on the lines *a*, *b*, *c*, which I have shown arranged at approximately 23°, 30° and 47°, respectively, to the transverse axis of the coupler, but which may be straight lines or in the form of shallow arcs. It will be seen that, in coupling, the line *c* provides a steep slope, against which the op-

posing jaw 5 strikes as the cars come together, and that the steepness of the slope accelerates the sliding of the jaw 5 along the buffing face 6 into its coupled position in the recess 7 in the jaw 4. By providing the face 6 at *c* at a steeper angle to the transverse axis of the coupler head I am also enabled to increase the amount of metal connecting the buffing jaw 5 with the coupler head, thereby strengthening the coupler at a point of possible weakness, since the coupler head at this point is weakened by being recessed for the lock pocket.

I have shown the buffing faces 6^a and 11 and pulling faces 8 and 9 arranged substantially at angles of 23° and 30°, respectively, to the transverse axis of the coupler, but, obviously, any reasonable variation may be made in such angles. It is, however, desirable that the coacting pulling faces 8 and 9 on the jaws 4 and 5 of opposing couplers be parallel, and that the buffing faces 6^a and 11 on these same jaws be also parallel, so as to provide in each case for firm and extended bearing of one of these surfaces against the corresponding surface on the opposing coupler.

I have found that with couplers constructed in accordance with my improved contour much greater ease of coupling is attained in all positions which the coupler may assume, regardless of whether the cars are on a straight track or on curves, and that the wear on the couplers is decreased, since they couple so readily that a second attempt at coupling is almost never necessary. The formation of the intermediate buffing face with its steep slope adjacent the buffing jaw not only has effected improved coupling operations but also provides greatly increased strength to the coupler and makes it more rugged and less liable to be damaged.

The terms and expressions which I have employed are used as terms of description and not of limitation, and I have no intention, in the use of such terms and expressions, of excluding any mechanical equivalents of the features shown and described, or portions thereof, but recognize that various structural modifications are possible within the scope of the invention claimed.

What I claim is:

1. A car coupler of the vertical plane type having rigid jaws disposed on opposite sides of its longitudinal center line, each jaw being provided with a buffing face and a pulling face, a guiding face intermediate said buffing faces and arranged at a greater angle to the transverse axis of said coupler than said buffing faces and sloping gradually into one of said buffing faces.

2. A car coupler of the vertical plane type having two oppositely disposed rigid jaws integral therewith, and a guiding and buffing face intermediate said jaws, said jaws being

adapted to interengage with correspondingly shaped jaws of an opposing coupler, a jaw and the intermediate face of one coupler forming with a jaw and the intermediate face of the other coupler when the couplers are intercoupled a space elongated in a direction transverse to the line of draft, and reciprocating locks having axes arranged at a substantial angle to the line of draft substantially filling said space when the couplers are in locked position.

3. A car coupler of the vertical plane type having integral therewith a gathering jaw and a buffing jaw, and an intermediate inclined face between the said jaws arranged angularly to the line of draft, the portion of the said intermediate face adjacent to the buffing jaw being at a greater angle to the transverse axis of the coupler than the remainder of the said intermediate face and gradually blending thereinto to assist in coupling and provide increased strength for the said buffing jaw.

4. A car coupler of the vertical plane type having two oppositely disposed jaws, pulling faces on each of said jaws arranged at the same angle to the transverse axis of the coupler, each jaw having a plurality of intersecting buffing faces arranged to engage complementary faces on an opposing coupler when interlocked therewith, and an uninterrupted guiding face intermediate the said buffing faces and arranged at a steeper slope than said buffing faces to guide the said jaws into locking position.

5. A car coupler of the vertical plane type having integral therewith a gathering jaw and a buffing jaw, the buffing jaw having a long and a short axis its long axis being arranged at a slight angle to the line of draft and having one buffing face in line with its long axis and another transverse thereto, a recess in the gathering jaw of greater depth than the long dimension of the buffing jaw and having angled faces against which the buffing faces of the buffing jaw bear in buffed position.

6. A car coupler of the vertical plane type having a buffing jaw and a guiding jaw, said jaws being rigid with respect to the coupler and being oppositely disposed to each other; and an intermediate inclined buffing and guiding face between said jaws, the inclination of said face with respect to the transverse axis of the coupler decreasing from the buffing jaw toward the guiding jaw.

7. A car coupler of the vertical plane type having two oppositely disposed jaws, one of said jaws having a recess therein having two adjacent faces forming buffing bearings arranged substantially at right angles to each other and the other jaw having a long and a short axis its long axis being arranged at a slight angle to the line of draft, a buffing bearing on the front face thereof and an ex-

tended buffing bearing along the outer side thereof parallel with its long axis, the said buffing bearings being arranged to engage complementary buffing bearings on an identically formed coupler head.

8. A car coupler of the vertical plane type having rigid jaws disposed on opposite sides of its longitudinal center line and being adapted to interengage with correspondingly shaped jaws of an opposing coupler, each jaw being provided with a buffing face and a pulling face arranged in planes oblique to the longitudinal axis of said coupler, one of said jaws having a locking face, a lock engaging said locking face when the couplers are coupled together, the opposite face of the lock being arranged substantially perpendicular to said pulling face and being engaged by a corresponding face of the lock of the opposing coupler.

JOHN WILLISON.

Jan. 18, 1927.

J. WILLISON

1,614,516

CAR COUPLER

Filed Jan. 31, 1924

2 Sheets-Sheet 1

Fig. 1.

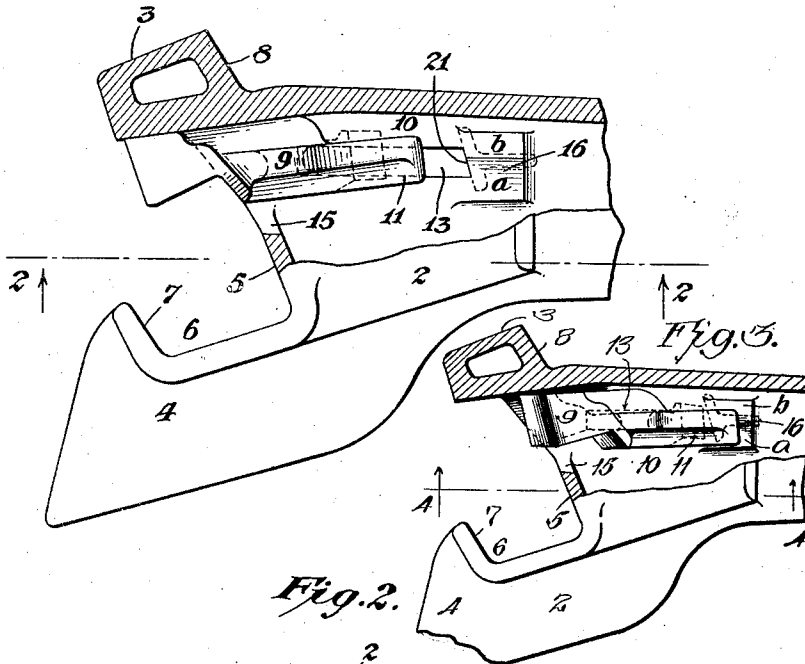
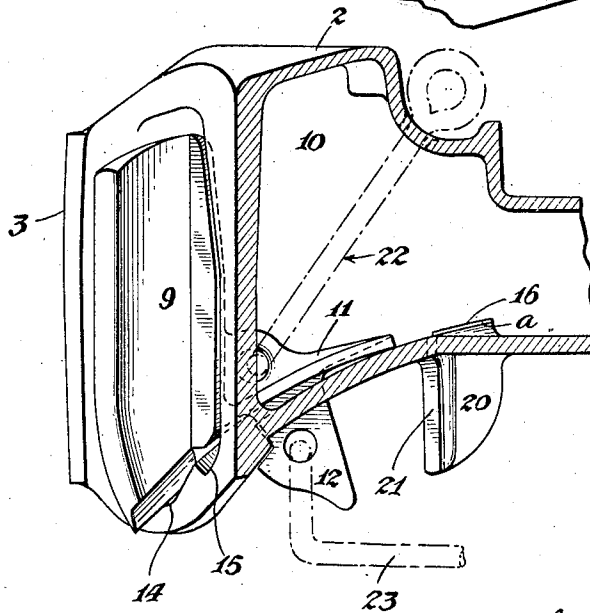


Fig. 2.



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1,614,516

CAR COUPLER

Filed Jan. 31, 1924

2 Sheets-Sheet 2

Fig. 7.

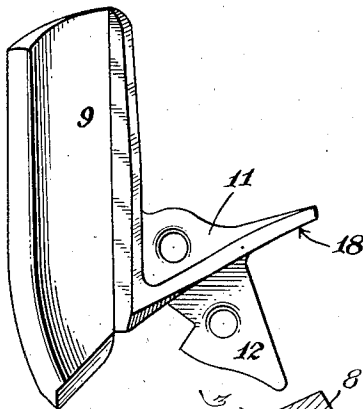


Fig. 5.

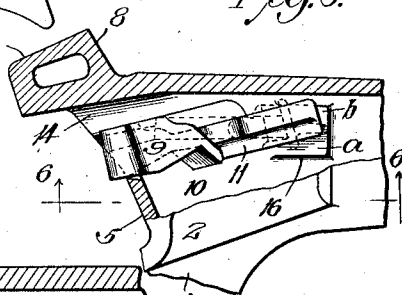


Fig. 8.

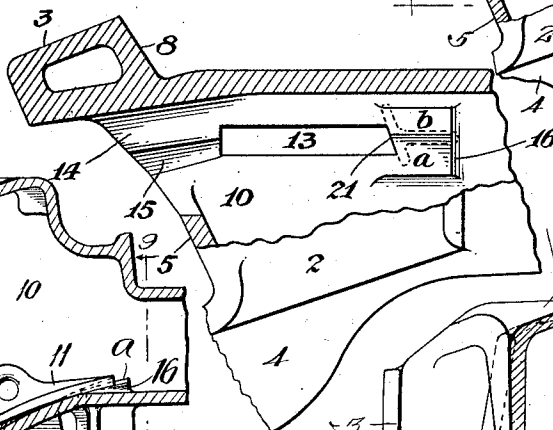


Fig. 4.

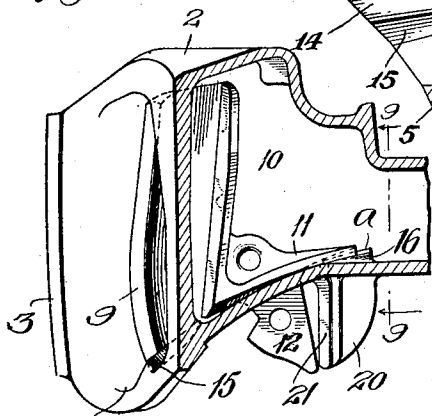


Fig. 6.

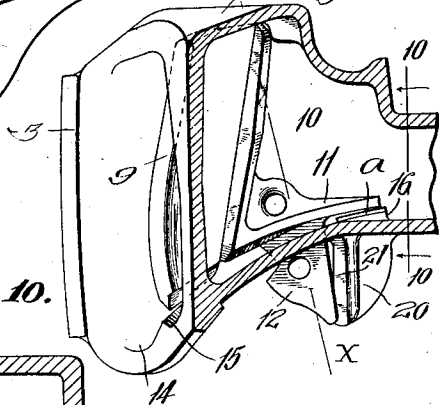


Fig. 9.

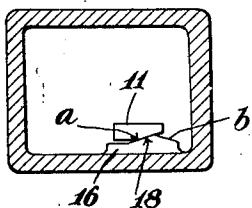
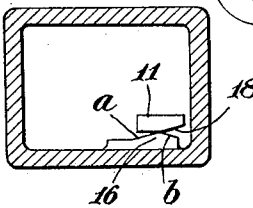


Fig. 10.



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BY
Clarence Dyer
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Patented Jan. 18, 1927.

1,614,516

UNITED STATES PATENT OFFICE.

JOHN WILLISON, OF CLEVELAND, OHIO, ASSIGNOR TO NATIONAL MALLEABLE AND STEEL CASTINGS COMPANY, OF CLEVELAND, OHIO, A CORPORATION OF OHIO.

CAR COUPLER.

Application filed January 31, 1924. Serial No. 639,670.

Fig. 1 is a plan partly in section of a coupler head embodying my invention with the lock in coupled or locked position; Fig. 2 is a vertical section on the line 2—2 of Fig. 1; Fig. 3 is a plan similar to Fig. 1 but with the lock in its rearward position, or unlocked position; Fig. 4 is a vertical section on the line 4—4 of Fig. 3; Fig. 5 is a plan similar to Fig. 3 but with the lock swung laterally ready to drop into the lock-set groove; Fig. 6 is a vertical section on the line 6—6 of Fig. 5; Fig. 7 is a perspective of the lock; Fig. 8 is a similar view to Fig. 1 but with the lock removed; and Figs. 9 and 10 are sections, respectively, on the lines 9—9 of Fig. 4 and 10—10 of Fig. 6.

My invention relates to car couplers of the vertical plane type such as are shown in my Letters Patent No. 1,201,665, dated October 17, 1916, and in my co-pending application No. 442,359, filed February 4, 1921, in which the coupler comprises a coupler head, a lock and a suitable actuating mechanism for the lock. The present invention particularly comprises so forming the lock and the corresponding and cooperating parts of the coupler head that its locking and lock-setting movements are rendered extremely reliable even when couplings are effected at a comparatively high speed. My invention also comprises the various features which I shall hereinafter describe and claim.

Referring to the drawings, the coupler is comprised of a coupler head 2, having a buffing jaw 3 and a pulling jaw 4 connected by a buffing face 5 arranged on an axis inclined laterally to the line of draft. The pulling jaw 4 has a laterally extending recess 6 to receive the complementary jaw 3 of the opposing coupler head and its pulling face 7 engages a complementary face 8 on the buffing jaw of the opposing coupler.

The lock 9 of the coupler operates in a pocket 10 which extends upwardly and rearwardly from the buffing face 5 into the coupler head. The lock has a rearwardly extending tail or guiding portion 11 and a downward extension or leg 12 which projects downwardly through a slot 13 in the floor of the coupler head. The tail 11 of the lock is, however, wider than the slot 13 and therefore has a bearing on the floor of the pocket at either side of the slot 13. In the floor of the forward part of the lock pocket 10 are the grooves 14 and 15. The groove 14

serves as a guide for the lock during its normal coupling and uncoupling movements, while the groove 15 carries the lock when in lock-set position.

The floor of the pocket is preferably in the form of a curve, which terminates in a raised surface 16. The surface 16 has an incline *a* and a face *b* meeting in a peak. The incline *a* is of greater extent than the face *b*, and slopes toward the pulling jaw 4 of the coupler, while the smaller face *b* is here shown sloping toward the buffing jaw side of the coupler. The under surface of the tail 11 of the lock has an inclination 18 corresponding to the incline *a*, and, accordingly, when the tail 11 of the lock is in engagement with the incline *a* the tendency of the tail 11 of the lock is to drift laterally toward the pulling jaw side of the coupler. This lateral movement of the tail of the lock toward the pulling jaw brings the leg of the lock in contact with the side of the slot 13 toward the pulling jaw, thus causing a rotative movement of the lock approximately about its point of engagement with the side of the slot 13. This results in a constant tendency of the forward portion of the lock to rotate toward the buffing jaw side and thus its normal movement is to enter the groove and slide down the groove 14, as is indicated in Figs. 3 and 4. When the lock is driven rearwardly under impact of an opposing coupler its movement is resisted by the resistance of its tail as it rises over the incline *a*, and its tendency is to drift away from instead of toward the lock-set groove 15, thereby diminishing the possibility of its being thrown into such groove 15 on a rebound when under a coupling impact. The rearward extent of the tail 11 of the lock also acts to prevent the rearward tilting of the lock and accordingly to minimize the liability of the lock from being displaced laterally from the locking groove 14 into the lock-set groove 15.

The under side of the coupler head to the rear of the slot 13 has a depending projection 20, which extends transversely of the coupler head. The forward face 21 of the projection 20 preferably inclines from the buffing jaw side to the rear and provides a lock-set fulcrum. When the lock is actuated by either top or bottom uncoupling rods 22 or 23 (shown in Fig. 2) it is pulled rearwardly until its downwardly extending leg

12 engages the fulcrum face 21 of the projection 20. Continued pulling causes rotation of the lock in a vertical plane about the point of contact of its leg 12 with the face 21 until its forward part has been lifted out of the guiding groove 14. The lock 9 will then have a rotary motion in a transverse direction approximately about the axis X—X indicated in Fig. 6, as the pull on the lock is exerted at a point laterally offset from the point of contact of the lock leg, which, as is shown in Figs. 5 and 6, will swing the lock into position to drop down into the lock-set groove 15 as soon as the lifter is released.

Couplers constructed in accordance with my invention are extremely effective in coupling operations because of the provision which prevents the locks from being thrown into lock-set position even under severe impact coupling conditions, and the lock-setting operations are also rendered very reliable.

The terms and expressions which I have employed are used as terms of description and not of limitation, and I have no intention, in the use of such terms and expressions, of excluding any mechanical equivalents of the features shown and described, or portions thereof, but recognize that various various structural modifications are possible within the scope of the invention claimed.

What I claim is:

1. A car coupler having two rigid oppositely disposed jaws, the coupler having a cavity therebetween, a lock movable in the cavity longitudinally of the coupler to assume a projected locking position and a retracted unlocking position, the lock having a rearwardly extending guiding portion engaging the floor of the coupler arranged to maintain the lock in position to be projected into locking position.

2. A car coupler having two rigid oppositely disposed jaws, the coupler having a cavity therebetween, a lock movable in the cavity longitudinally of the coupler to assume a projected locking position, a retracted unlocking position, and an elevated lock-setting position, the lock and the coupler having a projection and recess engagement in such lock-set position, the lock also having a rearwardly extending guiding portion engaging a portion of the coupler arranged to prevent the lock from accidentally assuming a lock-set position.

3. A car coupler having two rigid oppositely disposed jaws, the coupler having a cavity therebetween, a lock movable in the cavity longitudinally of the coupler to as-

sume a projected locking position and a retracted unlocking position, the lock having a depending leg arranged on retraction of the lock to engage a depending projection on the bottom of the coupler head and upon such engagement to be swung into lock-set position.

4. A car coupler having two rigid oppositely disposed jaws, the coupler having a cavity therebetween, a lock movable in the cavity longitudinally of the coupler to assume a projected locking position and a retracted unlocking position, the lock having a depending leg, a depending projection on the coupler head having an inclined forward face, and means for retracting the lock into engagement with said inclined forward face whereby the lock is rotated into position for lock-setting.

5. A car coupler having two rigid oppositely disposed jaws, the coupler having a cavity therebetween, a lock movable in the cavity longitudinally of the coupler to assume a projected locking position, a retracted unlocking position, and a lock-setting position, and means within the coupler cavity for preventing the lock from moving into lock-setting position except when actuated by the uncoupling mechanism.

6. A car coupler having two rigid oppositely disposed jaws, the coupler having a cavity therebetween, a lock movable in the cavity longitudinally of the coupler to assume a projected locking position and a retracted unlocking position, a locking groove and a lock-setting groove in the floor of the coupler head, means in the coupler head for normally guiding the lock into the locking groove as it is projected or retracted, and means on the exterior of the coupler for moving the lock into the lock-set groove.

7. A car coupler having two rigid oppositely disposed jaws, the coupler having a cavity therebetween, a lock movable in the cavity longitudinally of the coupler to assume a projected locking position and a retracted unlocking position, and means for tilting said lock rearwardly to assume a lock-set position.

8. A car coupler having two rigid oppositely disposed jaws, the coupler having a cavity therebetween, a guide in the cavity extending longitudinally of the coupler, a lock movable in the guide to assume a projected locking position and a retracted unlocking position, the coupler head having a recess therein adjacent said guide, and means whereby the lock on actuation by the uncoupling mechanism is tilted into a position to slide into the lock-set recess.

JOHN WILLISON.

Jan. 18, 1927.

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1,614,517

CAR COUPLER

Original Filed July 24, 1924 3 Sheets-Sheet 1

Fig. 1.

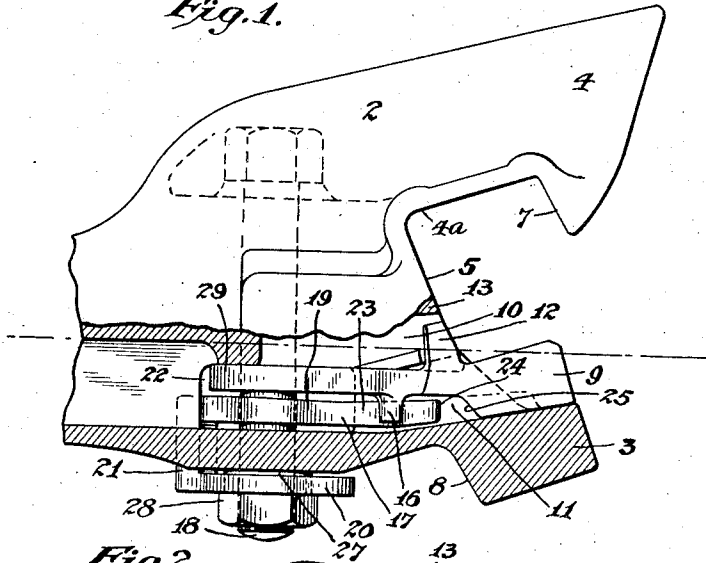


Fig. 2.

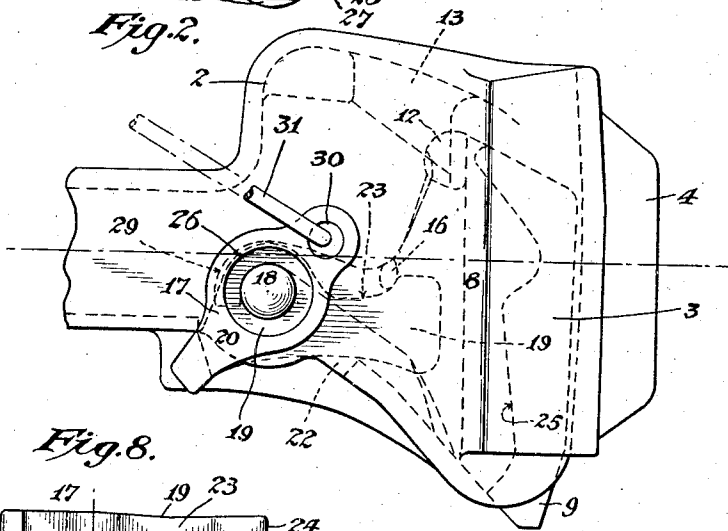


Fig. 8.

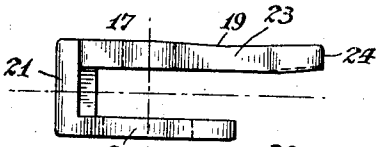


Fig. 10.

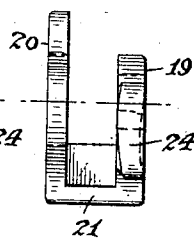
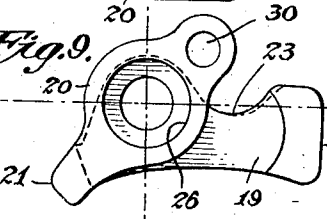


Fig. 9.



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Jan. 18, 1927.

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1,614,517

CAR COUPLER

Original Filed July 24, 1924 3 Sheets-Sheet 2

Fig. 3.

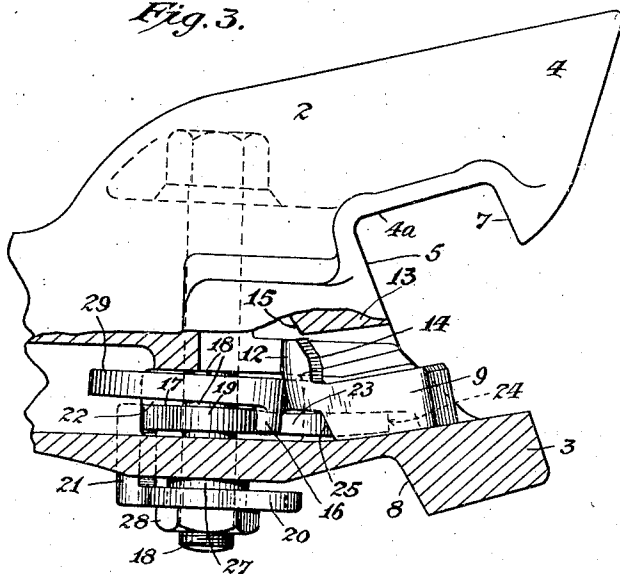


Fig. 4.

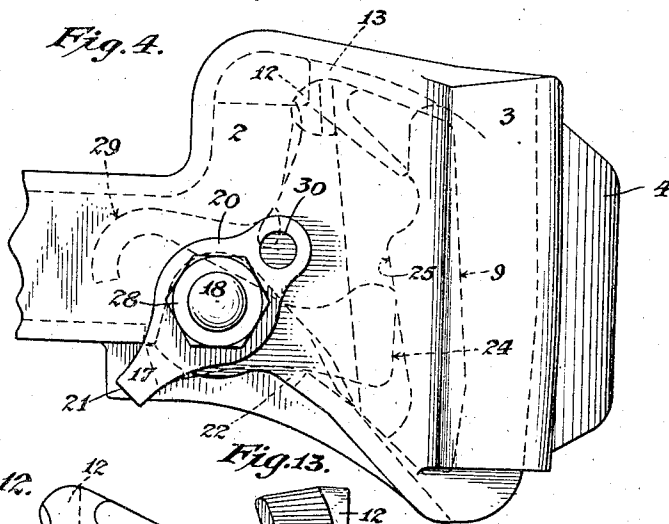


Fig. 12.

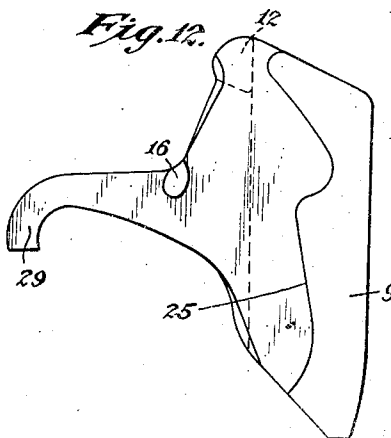


Fig. 13.

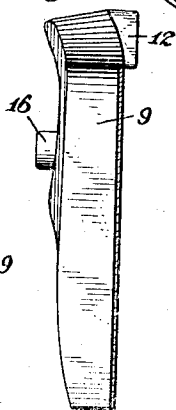
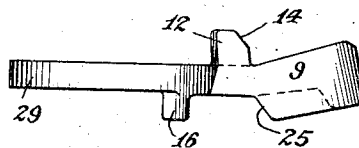


Fig. 11.



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BY
Clarence Kerr
ATTORNEY

Jan. 18, 1927.

J. WILLISON

1,614,517

CAR COUPLER

Original Filed July 24, 1924 3 Sheets-Sheet 3

Fig. 5.

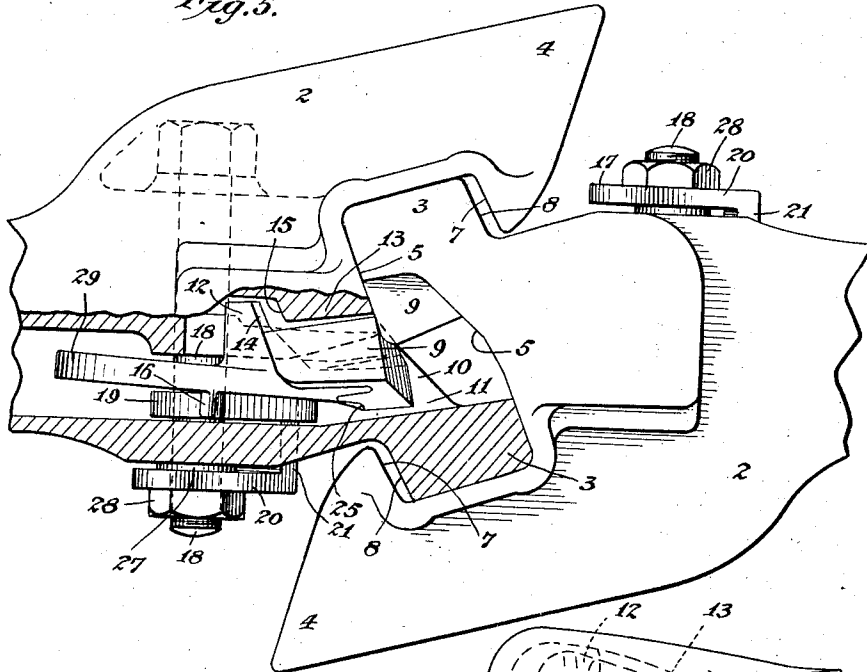


Fig. 6.

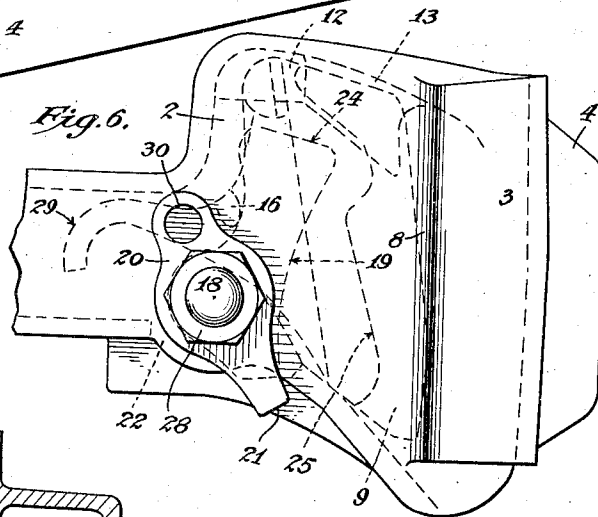
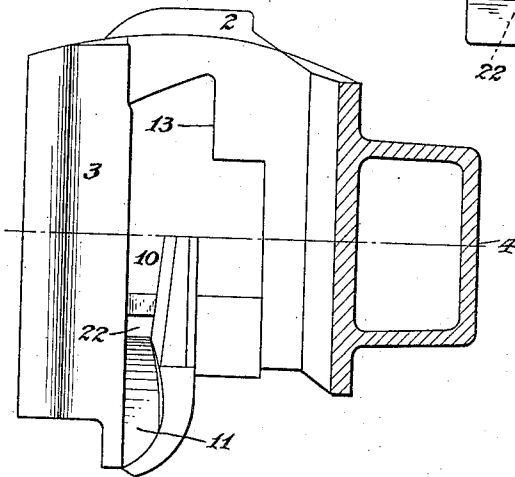


Fig. 7.



INVENTOR

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UNITED STATES PATENT OFFICE.

JOHN WILLISON, OF CLEVELAND, OHIO, ASSIGNOR TO NATIONAL MALLEABLE AND STEEL CASTINGS COMPANY, OF CLEVELAND, OHIO, A CORPORATION OF OHIO.

CAR COUPLER.

Application filed July 24, 1924, Serial No. 727,851. Renewed August 14, 1926.

Fig. 1 is a plan, partly in section, of a coupler embodying my invention with the parts in locked position; Fig. 2 is an elevation with the parts as shown in Fig. 1, but with the nut on the bolt removed; Fig. 3 is a plan similar to Fig. 1 but with the lock driven back against the impact stop; Fig. 4 is an elevation with the parts as shown in Fig. 3; Fig. 5 is a plan, partly in section, of a pair of couplers with the lock of one in lock-set position but before the actuating device has dropped back to normal position; Fig. 6 is an elevation of a coupler as shown in Fig. 5; Fig. 7 is a front elevation, partly in section, with the parts removed; Figs. 8, 9 and 10 show the operating lever in plan, side and front elevation respectively; and Figs. 11, 12 and 13 show the lock in plan, side and front elevation respectively.

My invention relates to car couplers of the vertical plane type such as are shown in my Letters Patent No. 1,201,665, dated October 17, 1916, and in my co-pending application No. 442,359, filed February 4, 1921, in which the coupler comprises a coupler head, a lock and a suitable actuating mechanism for the lock. The present invention particularly comprises so forming the lock and the corresponding and cooperating parts of the coupler head that its locking movements are rendered extremely reliable, even when couplings are effected at a comparatively high speed. My invention not only makes provision for controlling effectively the movement of the lock in coupler head, in all of its operations, but also for actuating it. My invention also comprises the various features which I shall hereinafter describe and claim.

Referring to the drawings, the coupler is comprised of a coupler head 2 having a buffing jaw 3 and a pulling jaw 4, connected by a buffing face 5 arranged on an axis inclined laterally to the line of draft. The pulling jaw has a laterally extending recess 4^a to receive the complementary jaw 3 of the opposing coupler head, and its pulling face 7 engages a complementary face 8 on the buffing jaw of the opposing coupler head.

The lock 9 of the coupler operates in a pocket or cavity 10 which extends upwardly and rearwardly from the buffing face 5 into the coupler head. The lock 9 operates in a groove 11 in the bottom of the cavity 10,

and has on the side toward the pulling jaw 4 intermediate the ends of the lock a lateral projection 12 with which the wall 13 at the side of the lock cavity 10 cooperates to hold the lock 9 in vertical position during the locking and unlocking movements of the lock 9. The wall 13, however, as is shown in Fig. 3, extends but a short distance into the coupler head and is there cut away to permit the lock to tip laterally into lock-set position as is shown in Fig. 5, when the projection has been moved to the rear of the wall 13. The forward face 14 of the projection 12 and the rear face 15 of the wall 13 are bevelled to guide the lock back to its normal vertical locking position. The lock 9 on the side opposite the projection 12 has a boss 16 intended to be engaged by the operating lever 17, which is pivotally mounted on the transverse bolt 18.

The lever 17 is comprised of two arms 19 and 20 joined at their rear ends by the web 21, both of which are apertured for the bolt 18. The arm 19 extends upwardly and forwardly through the opening 22 in the bottom of the lock cavity 10 into such cavity, and has a recessed top surface 23 which engages the boss 16 and thereby moves the lock 9 to unlocked position when rotated upon the bolt 18. The forward face 24 of the lever arm 19 is intended to be engaged by the shoulder 25 on the lock and thereby limits the rearward movement of the lock when it is driven rearwardly by a coupling impact, and thus prevents the lock from being thrown into lock-set position or from being jammed into the rear of the lock cavity.

The lever arm 20 extends outside the coupler head, and the aperture 26 therein is of a diameter to accommodate the circular shoulder 27 of the nut 28 upon which the arm 20 rotates. The shoulder 27 is of a depth greater than the thickness of the arm 20, so that when the nut 28 is turned up on the bolt 18 tight against the coupler head, it will not bind the arm 20. The lock 9 is provided with a rearwardly extending hook shaped tail 29, upon which the lock 9 rides over the bolt, and which steadies the lock and prevents it from tipping over rearwardly in the cavity. When the lock is in lowermost position the hook portion of the tail 29 engages the bolt 18 and thus limits the forward movement of the lock. Near the

extremity of the arm 20 is an aperture 30 for an actuating member or uncoupling rod 31.

In assembling the parts, the lock 9 is first placed in position in the lock cavity 10, the lever 17 is next put in position and then the bolt 18 is slid through the apertures in the coupler head and lever, and finally the nut 28 applied. The lock thus cannot be removed without first removing the bolt 18.

In the operation of the coupler just described, the lock is normally in lowermost position as shown in Fig. 1. When it is desired to uncouple, the lever 17 is turned on the bolt 18 in a counter-clockwise direction by means of the uncoupling rod 31. This rotates the arm 19 into contact with the boss 16 on the lock 9, and, as the rotation of the arm 19 is continued, causes the lock 9 to move upwardly and rearwardly to an extent sufficient to be disengaged from the lock of the opposing coupler so that the couplers may then be drawn apart without restraint.

If it is desired to place the lock 9 in lock-set position, the lock is actuated as just described, and when the operating rod 31 is released, the lever 17 falls back by gravity into the normal position. As is shown in Figs. 5 and 6, the lever has just been released and is about to drop back to normal position which is that occupied by the lever in Figs. 1 and 2. As the lock is then unrestrained, it will, because its center of gravity is toward the pulling jaw 4 and it is not held in vertical position by the projection 12, as such projection is now in the rear of the wall 13, tip laterally toward that jaw and as it slides forwardly the upper portion of its forward face will come into contact with the corresponding face on the lock of the opposing coupler head which is in locked position, as is shown in Fig. 5. The lock is thus held by the lock of the opposing coupler from sliding down into locked position. Then when the couplers pull apart, the lock because of bevelled faces 14 and 15 on the lock projection 12 and on the wall 13 in the coupler cavity, is free to slide down into lowermost or locked position.

When the lock 9 is driven rearwardly in coupling by the impact of an opposing coupler, its shoulder 25 strikes against the forward face 24 of the lever arm 19, thus preventing the lock from being driven further back into the lock cavity than is necessary in coupling as is shown in Figs. 3 and 4. When in this position the projection 12 is still opposite the wall 13 and the lock is therefore prevented from assuming a lock-set position.

Couplers constructed in accordance with my invention are extremely effective in coupling operation because of the provisions which prevent the lock from being thrown into lock-set position or from being jammed

into the rear of the coupler cavity. Even when couplings are made at a comparatively high speed, I have found the protection against premature lock-setting extremely satisfactory, and that the application of my invention has greatly improved the coupler and has made its operation very reliable.

The terms and expressions which I have employed are used as terms of description and not of limitation, and I have no intention, in the use of such terms and expressions, of excluding any mechanical equivalents of the features shown and described, or portions, thereof, but recognize that various structural modifications are possible within the scope of the invention claimed.

What I claim is:

1. A car coupler having two rigid laterally-separated oppositely-disposed jaws, the coupler having a longitudinally extending cavity therebetween, a lock movable in the cavity longitudinally of the coupler to assume a projected locking position and a retracted unlocking position, the lock having a bearing on the coupler to maintain it in alignment with its locking position, and a movable stop to prevent the lock from being driven out of engagement with said bearing under impact coupling.

2. A car coupler having two rigid laterally-separated oppositely-disposed jaws, the coupler having a longitudinally extending cavity therebetween, a lock movable in the cavity longitudinally of the coupler to assume a projected locking position and a retracted unlocking position, the lock having a bearing on the coupler to maintain it in alignment with its locking position, and lock actuating means interposed in the normal path of movement of the lock to prevent the lock from assuming a retracted position out of alignment with its locking position.

3. A car coupler having two rigid laterally-separated oppositely-disposed jaws, the coupler having a longitudinally extending cavity therebetween, a lock movable in the cavity longitudinally of the coupler to assume a projected locking position and a retracted unlocking position, the lock having a bearing on the coupler to maintain it in alignment with its locking position, and lock actuating means rotatable on its axis to engage the lock and retract it into a position to move into lock-set position.

4. A car coupler having two rigid laterally-separated oppositely-disposed jaws, the coupler having a longitudinally extending cavity therebetween, a lock movable in the cavity longitudinally of the coupler to assume a projected locking position and a retracted unlocking position, the lock having a bearing on the coupler to maintain it in alignment with its locking position, and lock actuating means having an arm forming in one position means for retracting the

lock and in another position means for limiting the movement of the lock under impact coupling with a like coupler.

5 5. A car coupler having two rigid laterally-separated oppositely disposed jaws, the coupler having a longitudinally extending cavity therebetween, a reciprocating lock positioned in said cavity, lock actuating means journaled in said cavity arranged on
10 movement about its axis to retract the lock into unlocked position but normally serving to limit the movement of the lock during coupling.

15 6. A car coupler having two rigid laterally-separated oppositely-disposed jaws, the coupler having a longitudinally extending cavity therebetween, a reciprocating lock positioned in said cavity, lock actuating means having an arm within and an arm without
20 the coupler, both arms being journaled on a horizontal shaft, and an uncoupling rod connected to the outside arm, the inside arm being arranged to engage the lock and move it into unlocked position.

25 7. A car coupler having two rigid laterally-separated oppositely-disposed jaws, the coupler having a longitudinally extending cavity therebetween and a groove in the bottom of the cavity, a lock movable in the
30 groove to assume a projected locking position and a retracted unlocking position, and stop members normally lying in the path of the lock to prevent its assuming a retracted position out of alignment with its locking
35 position or a projected position in advance of its locking position.

8. In a car coupler having a reciprocating lock, lock actuating means comprising an

arm within and an arm without the coupler head; and an uncoupling rod connected to the outer arm, the inside arm being arranged
40 to engage the lock and move it into unlocked position; said lock actuating means serving to limit the movement of the lock during coupling.

45 9. A car coupler comprising a head, a lock, and means for operating said lock, said lock when in locking position being adapted to overlap the lock of an opposing coupler, said
50 operating means being connected to said lock to retract it to a rearward unlocking position, and stop means interposed between said head and lock to limit the rearward movement of said lock, except when said
55 lock is retracted by said operating means.

10. A car coupler having a head with two rigid laterally separated oppositely disposed jaws, the coupler having a longitudinally extending cavity therebetween, a lock movable
60 in said cavity longitudinally of the coupler to assume a projected locking position and a retracted unlocking position, and stop means interposed between said lock and head to limit the rearward movement of said
65 lock when struck by an opposing coupler.

11. A car coupler having two rigid laterally separated oppositely disposed jaws, the coupler having a longitudinally extending cavity therebetween, a lock movable in the
70 cavity longitudinally of the coupler to assume a projected locking position and a retracted unlocking position, and a movable stop to prevent the lock from being driven to its retracted unlocking position under impact coupling.

JOHN WILLISON.

Feb. 8, 1927.

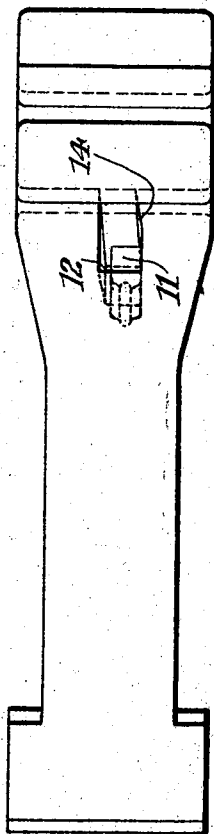
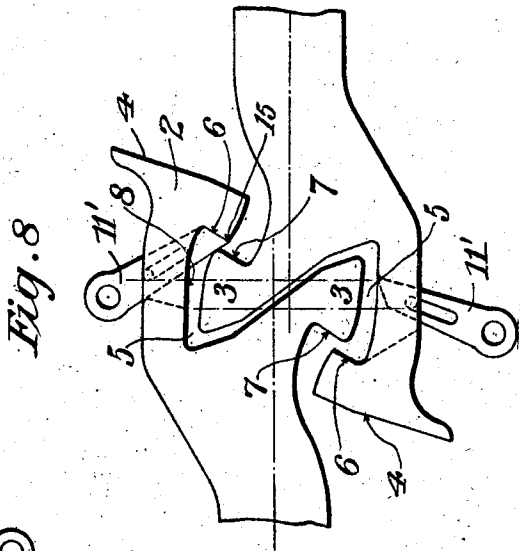
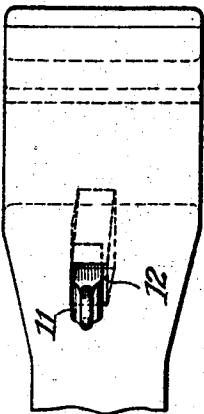
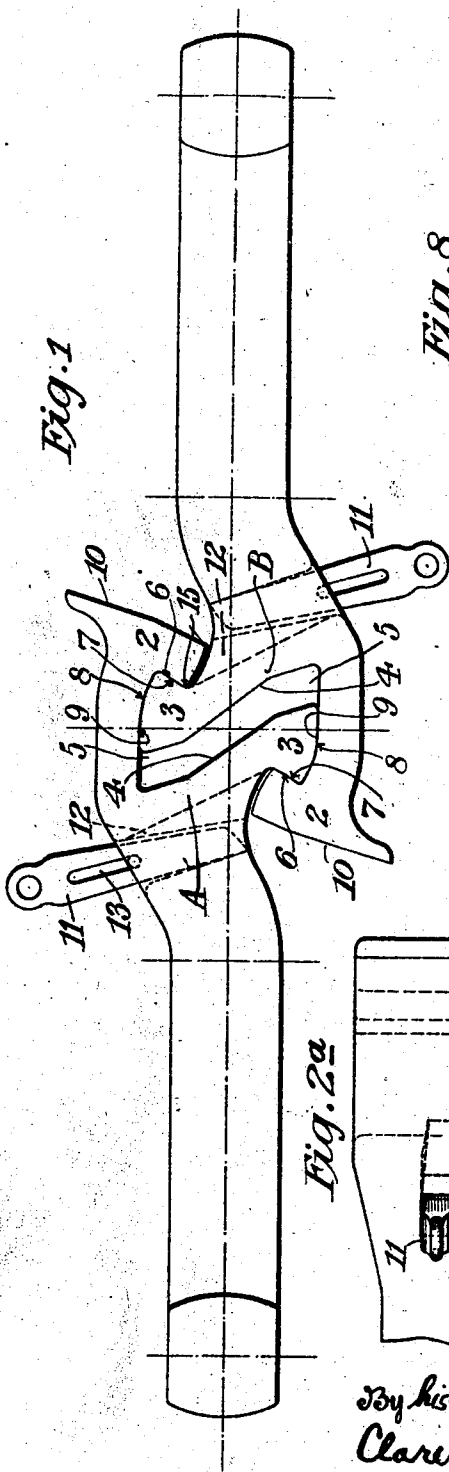
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1,616,937

CAR COUPLER

Filed Aug. 6, 1921

3 Sheets-Sheet 1



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Inventor
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Feb. 8, 1927.

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1,616,937

CAR COUPLER

Filed Aug. 6, 1921

3 Sheets-Sheet 2

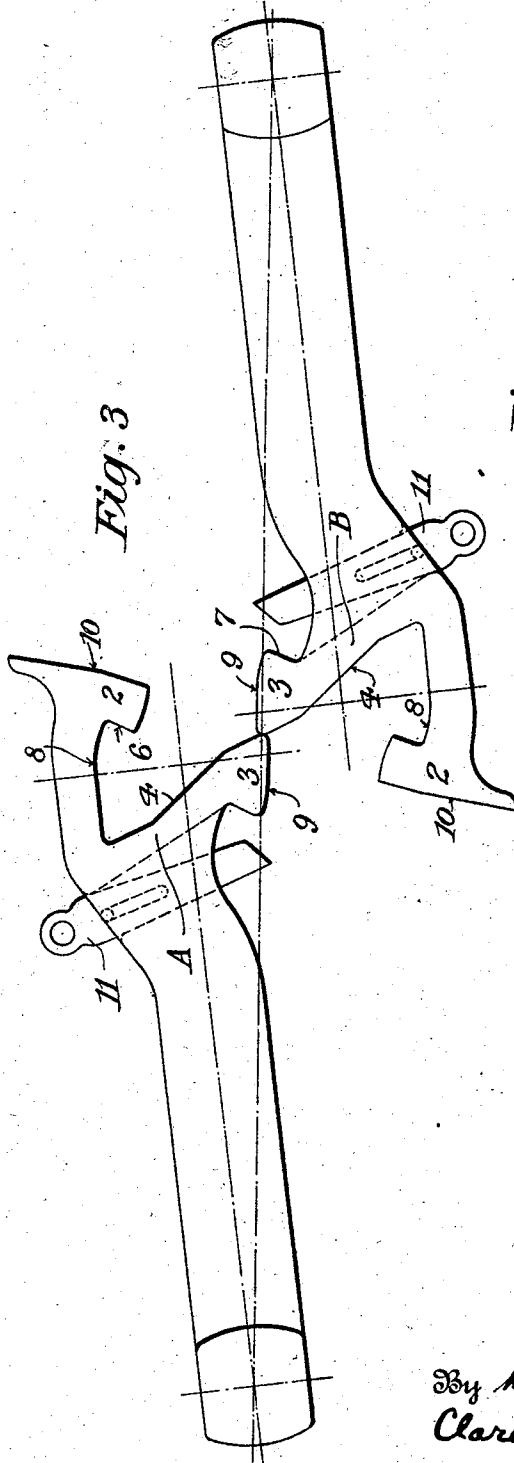
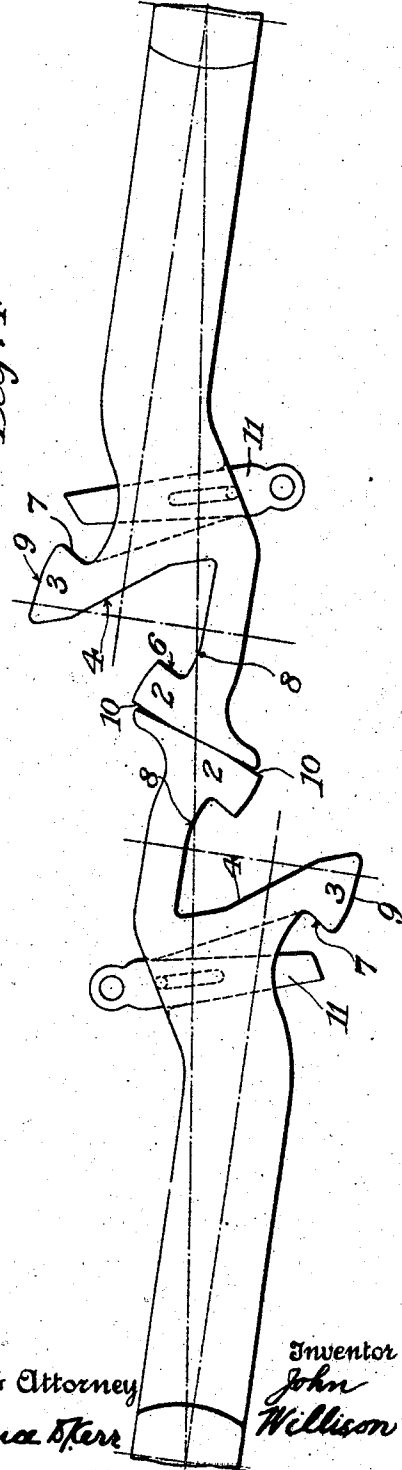


Fig. 4



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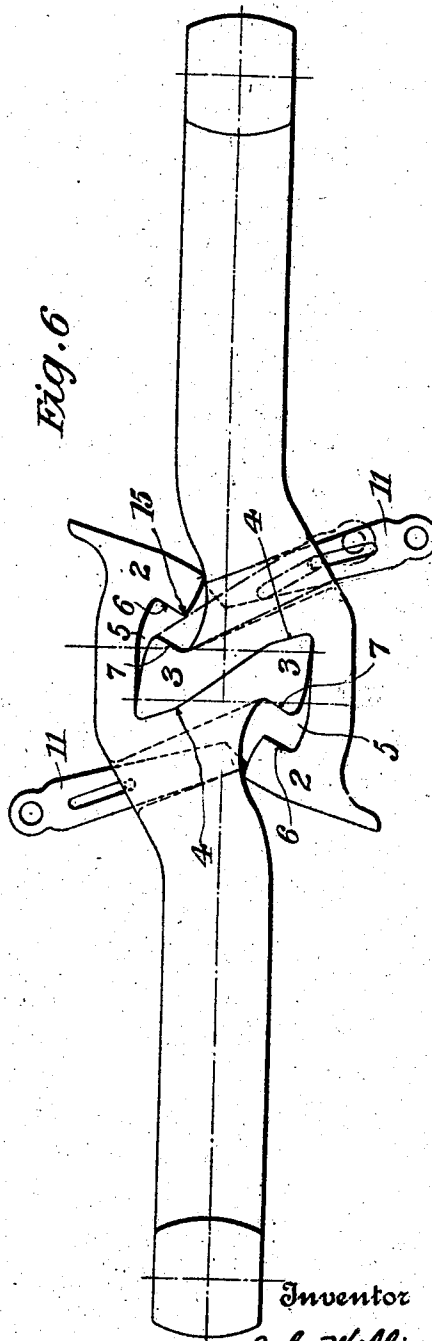
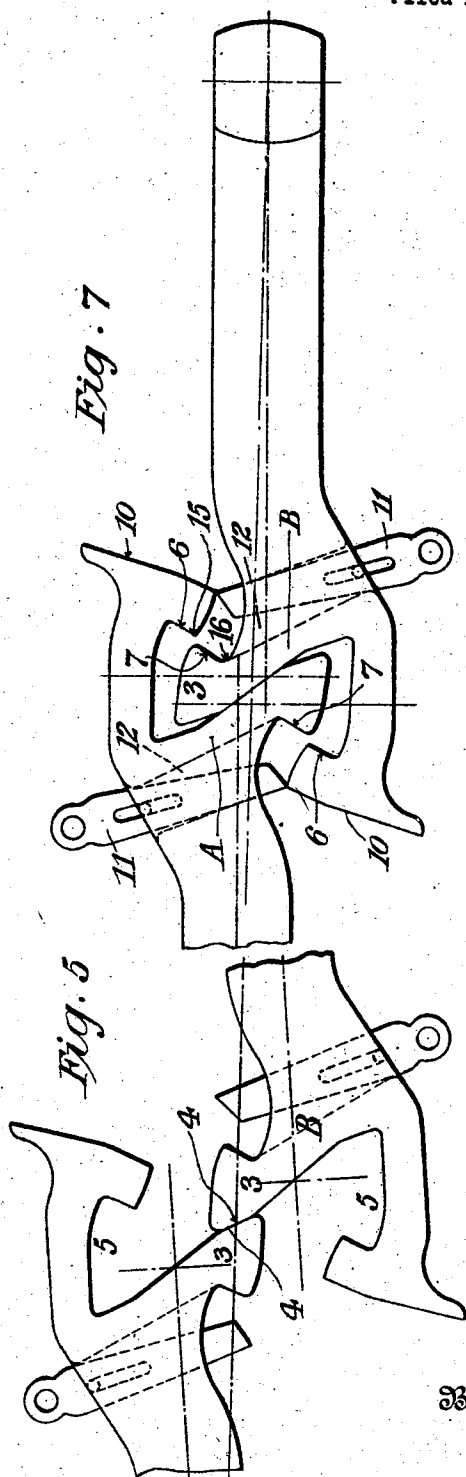
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1,616,937

CAR COUPLER

Filed Aug. 6, 1921

3 Sheets-Sheet 3



Inventor
By his Attorney John Willison
Clarence O. Kerr

UNITED STATES PATENT OFFICE.

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CAR COUPLER.

Application filed August 6, 1921. Serial No. 490,233.

Fig. 1 is a plan of a pair of couplers embodying my invention in interlocked or coupled position; Figs. 2 and 2^a are elevations of opposite sides of a single coupler; Figs. 3 and 4 are plans of couplers angled to extreme positions to the left and right, respectively; Fig. 5 is a plan showing the couplers guided into partial buffing position; Fig. 6 is a plan showing the coupler in full buffing position and also the operation of the uncoupling mechanism; Fig. 7 is a plan showing the operation of the uncoupling mechanism; and Fig. 8 shows a modified form of uncoupling mechanism.

My invention relates to couplers of the vertical plane type, and comprises a coupler which interlocks with the opposing coupler head without employing any of the usual movable parts such as knuckles or locks. My improved coupler is also provided with means for effecting the uncoupling of the interlocked heads. My invention further comprises the various features which I shall hereinafter describe and claim.

Referring to the drawings, A and B indicate the opposing coupler heads, each of which has rigid jaws or hooks 2 and 3 and a connecting buffing face 4 inclined at an angle to the center line of the coupler. Each coupler has a recess 5 to the rear of the jaw 2 to receive the complementary jaw 3 on the opposing coupler and permit their respective pulling faces 6 and 7 to become engaged. These pulling faces 6 and 7 are set at such an angle to the center line of the coupler that when these faces are engaged and the couplers are under draft they will tend to swing toward each other. In buff, also, the inclination of the buffing faces 4 tends to swing the couplers toward each other, but they are maintained in proper alignment by the faces 8 of the jaws 2 bearing against the faces 9 on the jaws 3.

As the couplers come together the vertical faces 10 on the jaws 2 and the faces 4 will guide the jaws 3 into the recesses 5 in the rear of the jaws 2, and when draft is applied the pulling faces 6 on the jaws 2 will engage the corresponding faces 7 on the jaws 3, which form reentrant angles with the faces 8 on these jaws.

Each coupler is provided with an uncoupling member 11, which is mounted in a transversely extending slot 12 in the coupler

shank just back of the coupler head and is prevented from removal therefrom by any suitable means, such as a pin and slot connection 13, by which the uncoupling member is permitted to be advanced into operative position or to be retracted into inoperative position. The forward portion 14 of slot 12 is inclined downwardly to the rear so as to allow the member 11 to slide rearwardly into inoperative position after the uncoupling operation has been completed.

When the couplers in moving together buff in the extreme angled position shown in Fig. 3, the engagement of the ends of the buffing faces 4 on the jaws 3 causes these faces to slide to the right along each other through the position shown in Fig. 5 into the full buffing position shown in Fig. 6, with the jaws 3 in the recess 5 of the jaw 2. Then, when draft is applied, the face 7 of the jaw 3 pulls forward against the face 6 of the jaw 2 and the couplers are thus brought into locked position shown in Fig. 1. When the couplers meet in the extreme angled position shown in Fig. 4 they are swung to the left until the jaws 2 clear the jaws 3 and then the buffing faces 4 guide the jaws 3 into the recesses 5, as has just been described above.

In uncoupling, the couplers are buffed to full buffed position, as shown in Fig. 6, and then either one of the uncoupling members 11 is swung over and pushed forward into the position in the recess 16 indicated by the dotted lines in Fig. 6. Then, when the couplers are under draft, the point of the jaw 2 will ride along the rear face of the uncoupling member 11 and be prevented from interlocking with the jaw 3, and the couplers will swing away from each other until the jaws 2 clear the jaws 3. The uncoupling member 11, as soon as it is relieved from the pressure from the point 15 of the jaw 2, slides rearwardly down the incline 14 into the position shown in Figs. 3 and 4 and during subsequent coupling movements is pushed back out of the way by the jaw 2, as is shown in the full line position of the uncoupling member in Figs. 6 and 7.

In Fig. 8 I have shown a modified form of my invention in which the uncoupling member 11' is mounted in a slot in the jaw 2. In this form the member 11' in advanced position fills in the reentrant angle in the jaw formed by the surfaces 6 and 8, and thereby

prevents the face 7 of the jaw 3 from engaging the face 6 of the jaw 2.

My invention is of great advantage, since it dispenses with the use of the usual
 5 knuckles and locks but nevertheless provides a light, strong and compact coupler of extreme simplicity which can be readily coupled or uncoupled. While no positive lock is provided, the couplers can not pull
 10 apart unintentionally unless they are first buffed together to take up the contour slack, and then while pulling apart one or both must slide laterally against the friction of the carry iron. As this lateral motion of
 15 the coupler is always opposed by friction of the carry iron, and as the couplers are normally forced laterally into full coupling position every time they are buffed, so that their pulling hooks are lined up to engage
 20 under draft, it is impossible to conceive accidental parting of the couplers under normal service conditions.

The terms and expressions which I have employed are used as terms of description
 25 and not of limitation, and I have no intention, in the use of such terms and expressions, of excluding any mechanical equivalents of the features shown and described, or portions thereof, but recognize that various
 30 structural modifications are possible within the scope of the invention claimed.

What I claim is:

1. A coupler head of the vertical plane type having a plurality of jaws integral
 35 therewith, a cavity on the inner side of one of said jaws having reentrant angles arranged to receive a complementary jaw of a similarly formed coupler head, each of said
 40 first named jaws having acutely angled surfaces for interlocking with the complementary jaws on the opposing coupler head.

2. A coupler head of the vertical plane type having a plurality of jaws, one of said jaws being of hook shape and arranged to
 45 receive within the bight of the hook a jaw of a similarly formed coupler head, and the other of said jaws being formed to fit into the bight of a hook-shaped jaw on the opposing coupler head, the said jaws having
 50 acutely angled faces comprising means for interengaging and holding the coupler heads together.

3. A coupler head of the vertical plane type having a laterally extending buffing
 55 face, a plurality of pulling jaws arranged to receive and engage complementary jaws of an opposing coupler for effecting coupling, and an uncoupling mechanism comprising a member insertable into one of the said jaws
 60 to prevent the complementary jaw on the opposing coupler from entering and interlocking therewith.

4. A coupler head of the vertical plane type having a plurality of jaws, one of said
 65 jaws having a recess therein, a similarly

formed opposing coupler head having a jaw with a projection arranged to enter the recess in the first mentioned head for effecting a coupling, an uncoupling member in the first mentioned coupler head mounted to permit the said coupler member being moved
 70 into said recess to prevent entrance therein to of the said projection and thereby prevent coupling.

5. A coupler head of the vertical plane type having a plurality of pulling jaws and a buffing face therebetween, one of said jaws having a recess on its rear side arranged to receive a complementary jaw on a similarly formed coupler head for effecting a coupling, and an uncoupling member
 80 mounted in said coupler head and movable transversely thereof into said recess to prevent coupling.

6. A coupler head of the vertical plane type having a plurality of interlocking jaws, one jaw having a recess on its rear side and the other a projection on its forward side, buffing faces on each jaw and also a buffing
 85 face between the jaws, said buffing faces being arranged to engage complementary buffing faces on a similarly formed opposing coupler and move said jaws laterally into position to engage a complementary projection and a complementary recess on the
 90 opposing coupler.

7. A coupler head of the vertical plane type having a pair of jaws each having a pair of acutely angled pulling faces, a clearance space to the rear of each such pair
 100 of faces arranged to give room for complementary jaws on an opposing coupler head having similarly formed faces, and an inclined buffing face between said jaws comprising means for bringing the said acutely
 105 angled faces into position for engagement.

8. A coupler head of the vertical plane type having a laterally extending buffing face, a plurality of jaws having a pulling engagement with complementary jaws of an
 110 opposing coupler for effecting coupling, a guiding face upon the forward side of one of said jaws, the plane of said guiding face being in advance of the forwardmost portion of the other of said jaws.

9. A coupler head of the vertical plane type having a laterally extending buffing face, a plurality of pulling jaws arranged to receive and engage complementary jaws of an opposing coupler for effecting coupling,
 120 one of said jaws being located forwardly of the other, guiding faces on the forward side of each of said jaws, the guiding face of the forwardmost jaw being of greater lateral extent than the distance between said
 125 jaws for the purpose of bridging the space between the jaws of an opposing coupling and thereby guide said couplers into coupling position.

JOHN WILLISON.

Aug. 23, 1932.

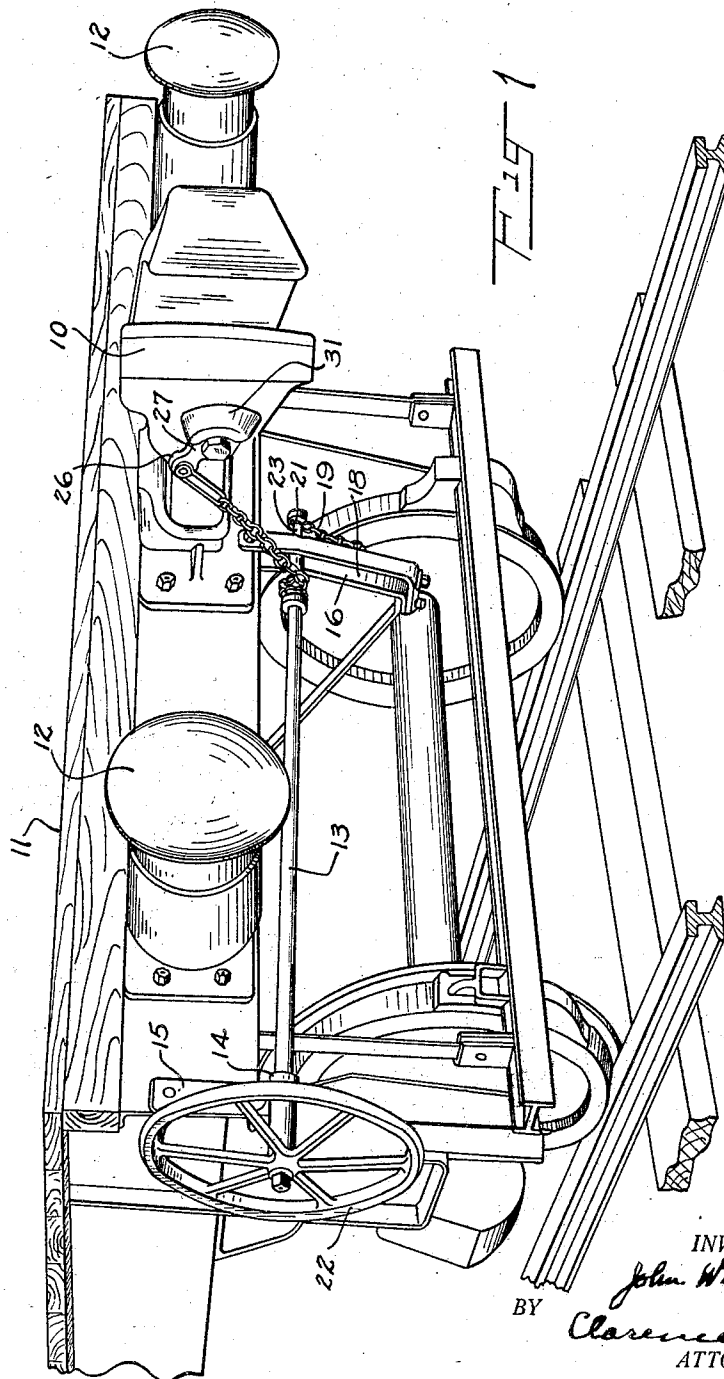
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1,873,092

UNCOUPLING MECHANISM FOR CAR COUPLERS

Filed Sept. 16, 1926

5 Sheets-Sheet 1



INVENTOR.
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Aug. 23, 1932.

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1,873,092

UNCOUPLING MECHANISM FOR CAR COUPLERS

Filed Sept. 16, 1926

5 Sheets-Sheet 2

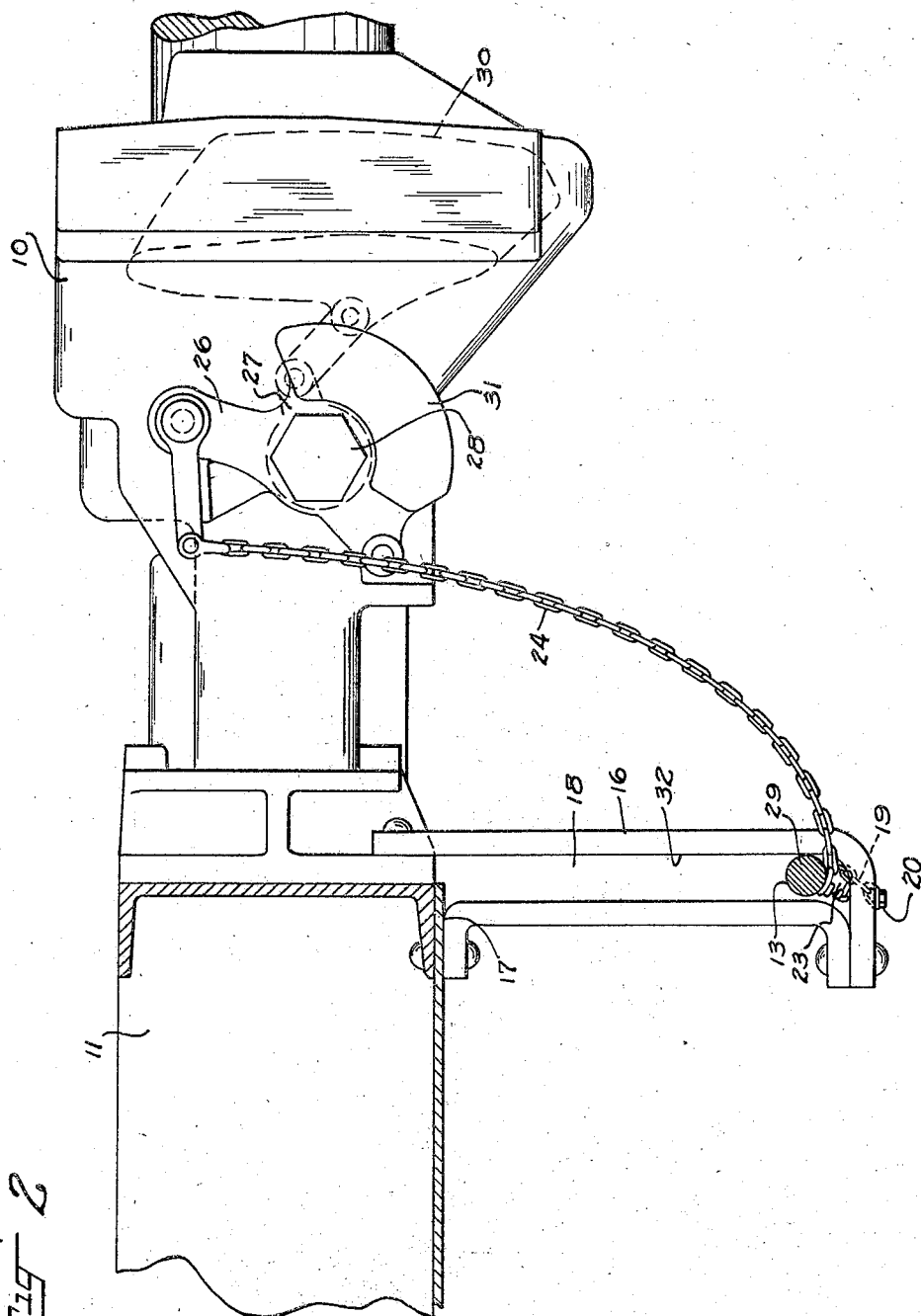


Fig. 2

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BY Clarence Kerr
ATTORNEY

Aug. 23, 1932.

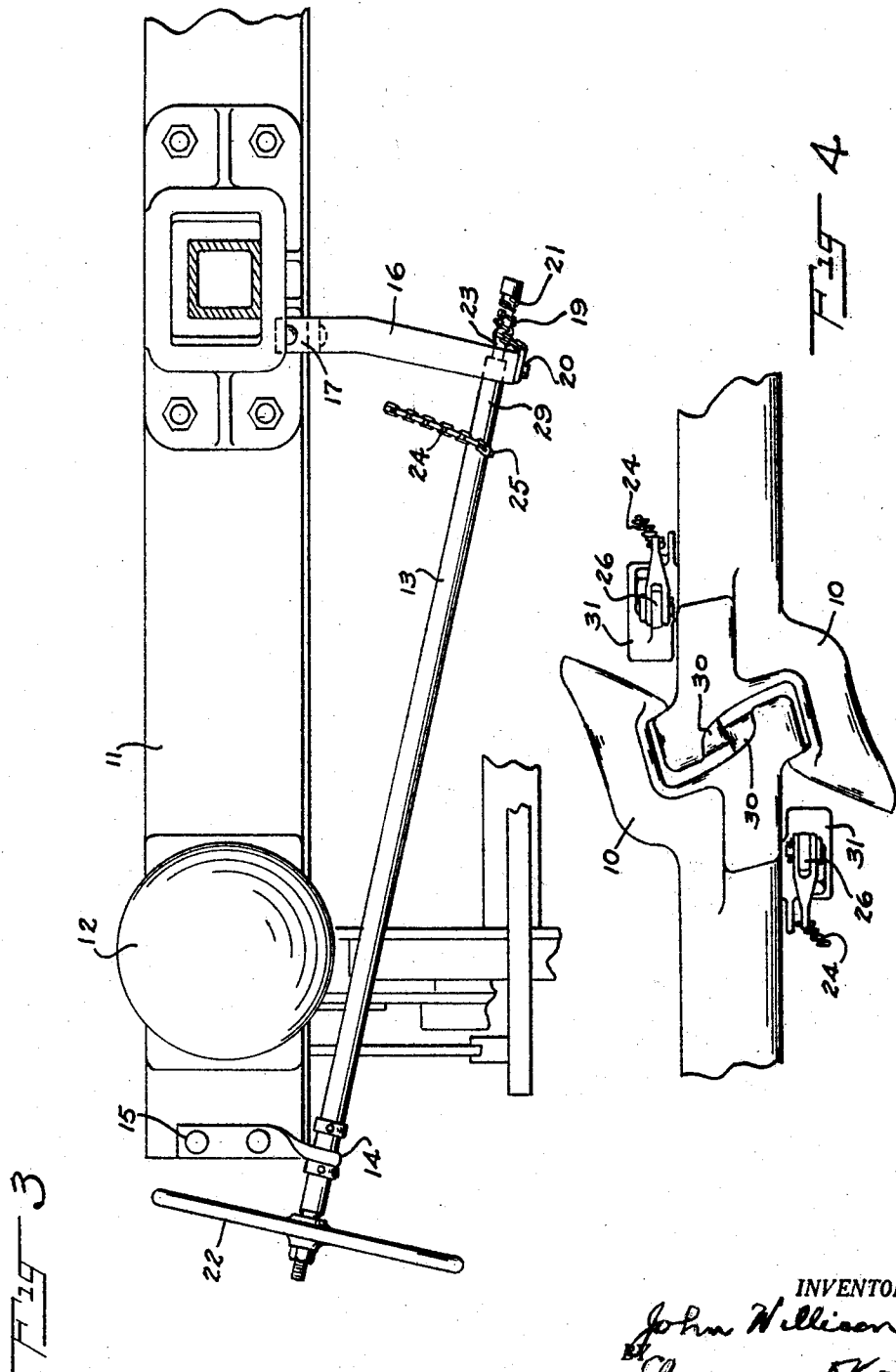
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1,873,092

UNCOUPLING MECHANISM FOR CAR COUPLERS

Filed Sept. 16, 1926

5 Sheets-Sheet 3



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Aug. 23, 1932.

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1,873,092

UNCOUPLING MECHANISM FOR CAR COUPLERS

Filed Sept. 16, 1926

5 Sheets-Sheet 4

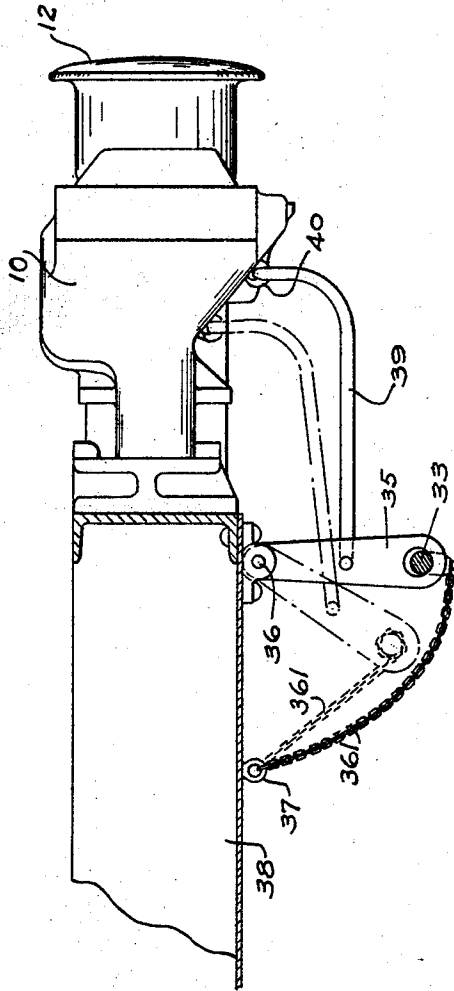


Fig 5

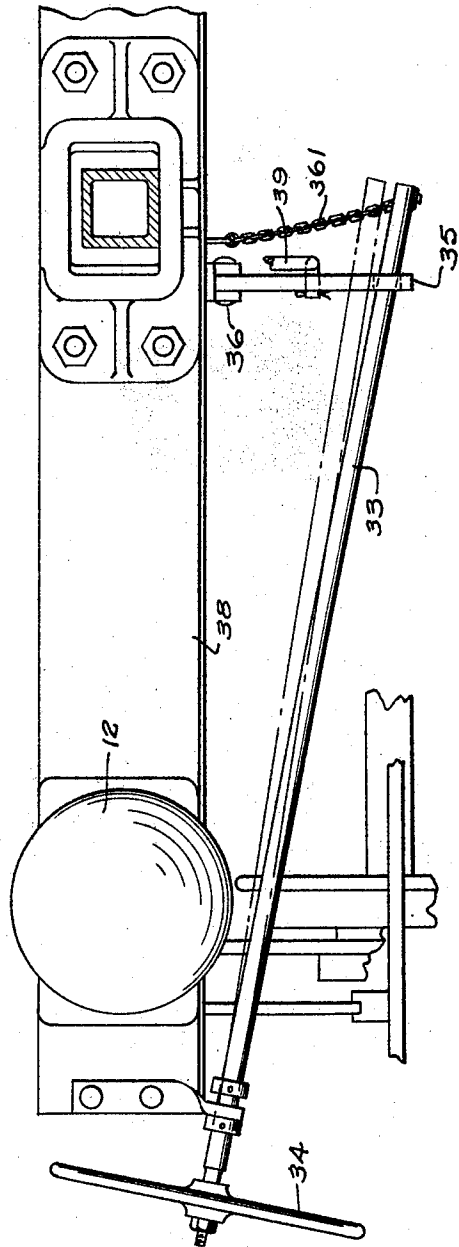


Fig 6

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1,873,092

UNCOUPLING MECHANISM FOR CAR COUPLERS

Filed Sept. 16, 1926

5 Sheets-Sheet 5

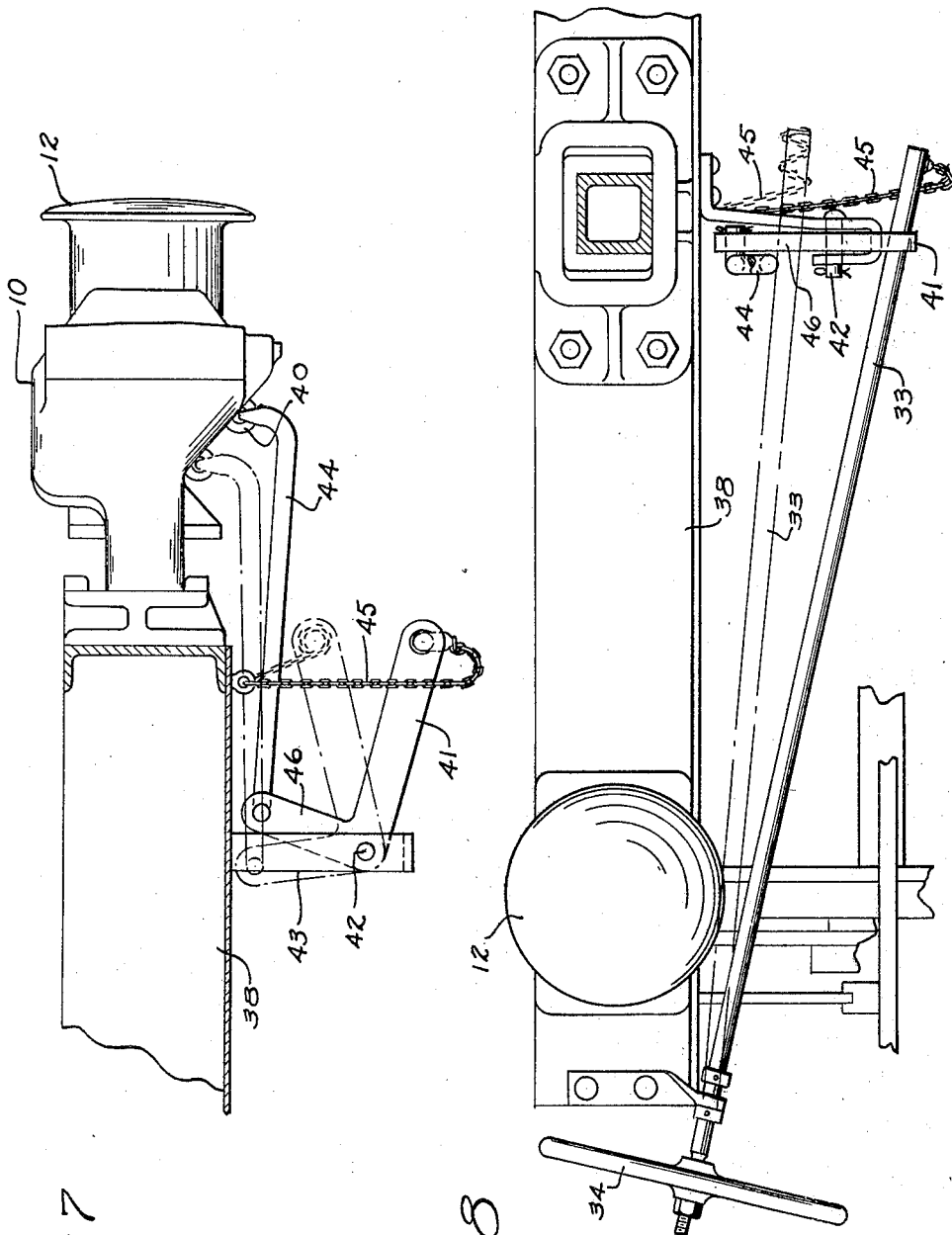


Fig. 7

Fig. 8

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John Willison
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UNITED STATES PATENT OFFICE

JOHN WILLISON, OF SHAKER HEIGHTS, OHIO, ASSIGNOR TO NATIONAL MALLEABLE AND STEEL CASTINGS COMPANY, OF CLEVELAND, OHIO, A CORPORATION OF OHIO

UNCOUPLING MECHANISM FOR CAR COUPLERS

Application filed September 16, 1926. Serial No. 135,711.

The following is a specification, reference being had to the accompanying drawings, in which:—

Fig. 1 is a view in perspective of a coupler and adjacent parts of a car structure equipped with uncoupling mechanism and showing the parts in uncoupling position; Fig. 2 is a view partly in side elevation and partly in vertical section of the device shown in Fig. 1, with the parts of the uncoupling mechanism shown in non-operating position; Fig. 3 is a view in end elevation and vertical section of the device shown in Fig. 1, with the parts again shown in inoperative position; Fig. 4 is a plan view of a pair of interengaged couplers of the type shown in Fig. 1; Fig. 5 is a view similar to Fig. 2 showing a modified form of the invention; Fig. 6 is a view similar to Fig. 3 showing the modified form of the invention; Fig. 7 is a view similar to Fig. 5 showing still another modification; and Fig. 8 is a view similar to Fig. 6 showing the modified form of the invention illustrated in Fig. 7.

My invention relates to releasing or uncoupling mechanism for railway vehicle couplers of the type in which a tight coupling connection is provided. In this type of coupler, in connection with which spring buffer members are provided on the confronting ends of the vehicle frames, a very substantial tension is continually maintained between the coupled members through the compression of the buffer springs, in order to prevent slackness or looseness between the connected cars. The taut condition thus existing between the engaged parts gives rise to considerable difficulty in releasing the tightly held locking mechanism to disengage the coupler parts in performing the uncoupling operation. My invention has for its object the provision of means by which the uncoupling operation can be easily and effectively carried out. In order to accomplish this object an actuating hand wheel is

provided for convenient operation by an attendant without entering between the ends of adjacent cars. The hand wheel is mounted on a shaft journaled at its outer end in a bearing mounted on a corner portion of the car framework and extending transversely to a point below and adjacent to the coupler structure. The inner end of the shaft is attached to a chain anchored to a rigid part at its other end so that rotation of the shaft by the hand wheel brings about bodily movement of the end of the shaft to produce, through suitable connections, corresponding movement of the coupler locking mechanism. In a preferred embodiment of the invention, the connection between the hand wheel shaft and the lock releasing mechanism takes the form of a chain attached to a section of the shaft differing in diameter from the section to which the anchored chain is connected, so that a differential winding action is produced by the rotation of the shaft to produce a powerful leverage effect which is utilized in the actuation of the release mechanism. Other features of the invention will be hereinafter described and claimed.

Referring to the drawings for a more detailed description of the invention, in Figs. 1, 2 and 3 a coupler member 10 is shown mounted on the end of a car structure 11, the coupler being flanked on either side by resilient buffer members 12 which are compressed when the coupler devices of adjacent cars are interlocked to produce a coupled relation between cars which is free from slackness or looseness.

The snugness or tightness of the coupled relation which is brought about by the compression of the buffer members to bring the coupling devices into interlocking relation is substantial, amounting to a pressure of two or three tons. This substantial pressure between the interconnected parts of the coupler mechanism gives rise to considerable difficulty in releasing the locking mechanism

which holds the coupler devices in interlocked position.

In order to utilize a releasing action of sufficient power to bring about the desired disengagement of the coupler parts, I have employed an effective application of a differential lever effect through which a sufficiently advantageous leverage action is obtained to release the coupled parts with a minimum of effort on the part of the operator.

This structure takes the form of a shaft 13 loosely journaled at one end in a bearing support member 14 attached at 15 to an end of the car end sill. The other end of the shaft 13 in the form of the invention shown in Figs. 1, 2 and 3 extends through a downwardly extending vertically slotted bracket member 16 attached to the car framework at 17 at a point to the rear of the coupler structure. The vertical slot 18 in the downwardly extending bracket 16 provides for vertical movement of the free end of the shaft 13 which extends through the slot in the bracket.

A flexible tensile member in the form of a chain 19 is attached at one end as at 20 to the lower end of the bracket member 16 and attached at its other end as at 21 to the shaft 13. With this arrangement, it will be seen that rotation of the shaft 13 brought about through the operation of a hand wheel 22 has the effect of winding up the chain 19 on the adjacent portion of the shaft 13. It will be noted that the portion 23 of the shaft 13 on which the chain is wound has a reduced diameter relative to the diameter of the shaft itself.

Another chain 24 is attached at 25 to the shaft 13 at one end and at its other end to an arm 26 formed on a lock actuating or releasing member 27 pivotally mounted at 28 on the framework of the coupler device 10. The relation of the chain members 19 and 24 is such that when one is wound on the shaft 13, the other is unwound and vice versa.

A feature of the invention is the provision of a differential effect produced by causing the chain members 19 and 24 to be wound on sections of the shaft 13 which have different diameters. In other words, that section 29 of the shaft 13 on which the chain 24 is wound has a greater diameter than the diameter of the section 23 which receives the chain 19. With this structural arrangement, it will be seen that the rotation of the shaft 13 in a clockwise direction to wind the chain 24 thereon produces a rising movement of the free end of the shaft 13 within the vertical slot 18 formed in the bracket member 16. It will be noted, however, that since the chain 19 is wound on a section of less diameter than the section 29 on which the chain 24 is wound, a restriction on the upward movement of the shaft is produced which prevents the lift of the shaft in strict accordance with the winding action of the chain 24 thereon. This re-

striction on the upward movement of the shaft 13 by the restraining action of the chain 19 produces a pull on the chain 24 which has the effect of pulling downwardly the arm 26 of the lock releasing member 27 from the position shown in Fig. 2 of the drawings to the position shown in Fig. 1, thereby releasing the lock member 30 and bringing about the desired uncoupling of the interengaged coupler parts. This pull on the lock releasing member, which is produced as a result of the differential winding of the two chain members 19 and 24 on the shaft 13, is extremely powerful and the result is that a relatively moderate effort applied to the rotation of the hand wheel 22 effects the lock releasing action although the pressure existing between the interengaged parts is relatively enormous.

Upon the release of the hand wheel 22 following the accomplishment of the lock withdrawing action, the weight of the free end of the shaft 13 will cause the shaft to drop back to the lower end of the slot 18, thereby unwinding the chain 24 and winding the chain 19 in place on the section 23 of the shaft. This unwinding of the chain 24, which is automatically accomplished, releases the lock releasing member 27 so that a counterweight 31 formed thereon rotates the member from the withdrawn position shown in Fig. 1 to the position shown in Fig. 2 in which the locking member 30 of the coupler structure has resumed its normal position.

It will be noted that in the rotation of the shaft 13 in a clockwise direction to effect the lock releasing operation, the shaft member 13 rolls along the inner surface 32 of the forward part of the bracket 18 thereby facilitating the operation of the parts by the elimination of friction which is achieved thereby.

It will be noted that a certain further advantage of lever structure is attained in the attaching of the restricting chain member 19 to the outer end of the shaft 13 while the operating chain member 24 is attached to the shaft at a point inside the point of connection of the chain 19 thereto. It will be seen that since that portion of the shaft to which the chain 19 is attached has the greater travel and is further from the fulcrum point at the bearing 14, an advantage as to power is obtained in the operation of the chain 24. This advantage is added to that already referred to in the differential structure, further tending to the operation of the releasing mechanism with a minimum expenditure of muscular energy applied to the hand wheel 22.

In the modified form of the invention shown in Figs. 5 and 6 a shaft member 33 and a hand wheel 34 are employed as in the structure already described. In this form of the invention instead of making use of the dif-

ferential effect, the free or inner end of the shaft 33 extends through the lower end of an arm 35 pivoted at its upper end at 36 to the car framework. A chain 361 is attached at one end to an eyebolt 37 affixed to the car framework 38 and is connected at its other end to the shaft 33. A pull or retracting member 39 is attached at one end to the arm 35 and at its other end to a lock releasing member 40 carried by the coupler mechanism 10.

With this arrangement, the operation of the lock releasing member 40 is accomplished by rotating the shaft 33 in either direction so that the chain 361 is wound thereon with a resulting swinging of the pivoted arm 35 from the position shown in full lines in Fig. 5 to the position shown in dotted lines, thereby producing a pull on the retracting member 39 to correspondingly move the lock releasing member 40 and produce the desired uncoupling action.

Still another form of the invention is shown in Figs. 7 and 8 in which the shaft 33 is passed at its free end through an end of a bell crank lever 41 pivoted at 42 in a downwardly extending bracket 43 mounted on the car framework 38. The other end of the bell crank lever 41 is connected to a pull or retracting member 44 which is attached to the lock releasing member 40. A chain 45 is connected at one end to the car framework 38 and at its other end to the shaft 33. In operation rotation of the shaft 33 in either direction produces a winding action of the chain 45, thereby bringing about vertical swinging movement of the horizontally extending arm of the bell crank lever 41 and producing a corresponding movement to the left of the upwardly extending arm 46 of the bell crank lever to produce the desired pulling action on the retracting member 44 to operate the lock releasing member 40.

The terms and expressions which I have employed are used as terms of description and not of limitation, and I have no intention, in the use of such terms and expressions, of excluding any mechanical equivalents of the features shown and described, or portions thereof, but recognize that various structural modifications are possible within the scope of the invention claimed.

What I claim is:—

1. In an uncoupling mechanism for car couplers, a lock releasing member, a rotatable shaft, a bearing support on a corner portion of the car structure in which the shaft is journaled adjacent one end thereof, the other end of the shaft being extended to a point adjacent the coupler mechanism and having a capability of translatory movement in a direction transverse to the axis of the shaft, a tensile member attached at one end to the free end of the shaft and at the other end to a fixed part at the side of the shaft

remote from the coupler, a reduced section in the shaft on which said tensile member is adapted to be wound, and another tensile member attached at one end to the shaft and at the other end to the lock releasing member, one of said tensile members being adapted to be wound on the shaft when the other is unwound, whereby the shaft may be rotated to wind the tensile member connected to the lock release member and to effect a pulling action thereon through the differential action of the winding operations.

2. In an uncoupling mechanism for car couplers, a lock releasing member, a rotatable shaft, a bearing support on a corner portion of the car structure in which the shaft is journaled adjacent one end thereof, a downwardly extending vertically slotted bracket member mounted on the car framework to the rear of the coupler device, the other end of the shaft extending through said slot, a flexible tensile member attached at one end to the free end of the shaft and at the other end to the lower end of the bracket member, and another flexible tensile member attached at one end to the shaft and at the other end to the lock releasing member, the shaft section on which the tensile member attached to the bracket is wound having a less diameter than the section on which the tensile member connected to the lock releasing member is wound, whereby a differential effect is produced when the shaft is rotated to wind the tensile member connected to the lock releasing member and a pulling action on the lock releasing member is achieved.

3. In an uncoupling mechanism for car couplers, a lock releasing member, a rotatable shaft, a bearing support on a corner portion of the car structure in which the shaft is journaled adjacent one end thereof, a downwardly extending vertically slotted bracket member mounted on the car framework to the rear of the coupler device, the other end of the shaft extending through said slot and having a reduced section in the portion protruding through the bracket member, a tensile member attached at one end to the reduced portion of the shaft and at the other end to the lower end of the bracket member, another tensile member attached to the shaft at the other side of the bracket and attached at the other end to the lock releasing member, and a hand wheel mounted on the end of the shaft adjacent the bearing support.

4. In an uncoupling mechanism for car couplers, a lock releasing member, a rotatable shaft, a bearing support on a corner portion of the car structure in which the shaft is journaled adjacent one end thereof, a downwardly extending vertically slotted bracket member mounted on the car framework to the rear of the coupler device, the other end of the shaft extending through said slot and having a reduced section in the por-

tion protruding through the bracket member, a tensile member attached at one end to the reduced portion of the shaft and at the other end to the lower end of the bracket member, a tensile member attached at one end to the shaft at the other side of the bracket and attached at the other end to the lock releasing member, and a hand wheel mounted on the end of the shaft adjacent the bearing support, said shaft being arranged to roll along the rearward surface of the forward wall of the bracket when the tensile member connected to the lock releasing member is wound thereon, the upward movement of the shaft in the slot being restricted by the tensile member attached to the reduced section whereby a pull is transmitted to the lock releasing member to operate the same.

5. In an uncoupling mechanism for car couplers a lock releasing member, a rotatable shaft having one end mounted for translatable movement in a direction transverse to its axis, a flexible member connected at one end to the shaft and at the other end to a fixed part whereby translatable movement is imparted to the end of the shaft upon rotation thereof, and a connection between the shaft and the lock releasing member, said connection being such that the translatable movement of the end of the shaft is utilized to increase the leverage on the lock releasing member.

6. In an uncoupling mechanism for car couplers, a lock releasing member, a rotatable shaft having an end mounted for translatable movement in a direction transverse to its axis, a flexible tensile member attached at one end to the shaft for winding thereon and at the other end to a fixed part, means for rotating the shaft and with said tensile member controlling the movement of the end thereof, and a connection between the shaft and the lock releasing member, said connection acting in conjunction with the translatable movement of the shaft end to increase the mechanical effectiveness of the force transmitted to the lock releasing member.

7. In an uncoupling mechanism for car couplers, a lock releasing member, a rotatable shaft, a bearing support in which the shaft is journaled adjacent one end thereof, the other end of the shaft being free to partake of translatable movement in a direction transverse to the axis of the shaft, a flexible tensile member attached at one end to the free end of the shaft for winding thereon and at the other end to a fixed part, means for rotating the shaft and with said tensile member controlling the translatable movement of the free end thereof, and a connection between the shaft at a point outwardly from the free end of the same and the lock releasing member, said connection being such that the translatable movement of the end of the shaft is utilized to increase the mechani-

cal effectiveness of the force transmitted to the lock releasing member.

8. In an uncoupling mechanism for car couplers, a lock releasing member, a rotatable shaft, a bearing support on a corner portion of the car structure in which the shaft is journaled adjacent one end thereof, the other end of the shaft being extended to a point adjacent the coupler mechanism and having a capability of translatable movement in a direction transverse to the axis of the shaft, a flexible tensile member attached at one end to the free end of the shaft and at the other end to a fixed part, a hand wheel on the end of the shaft adjacent the bearing support, and a pull connection between the free end of the shaft and the lock releasing member, said tensile member and said pull connection engaging portions of the shaft having different diameters, the tensile member and pull connection being wound upon the shaft in reverse directions whereby translatable movement of the shaft is utilized to increase the mechanical effectiveness of the force transmitted to the lock releasing member.

9. An uncoupling mechanism for car couplers comprising a rotatable shaft and members connected to said shaft, one of said members being connected to said car coupler and another to a fixed part of the car, said shaft and members being constructed and arranged to provide a differential means for causing a powerful pulling action on the member connected to said coupler.

10. In an uncoupling mechanism for car couplers, a lock releasing member, a rotatable shaft mounted for bodily movement in a direction transverse to its axis, connecting means between the shaft and lock releasing member to actuate the lock releasing member upon rotation of said shaft, and means disposed between the shaft and a fixed part to enable bodily movement of the shaft upon rotation thereof, said bodily movement being in such direction as to retard the action of the connection between the shaft and the lock releasing member.

11. In an uncoupling mechanism for car couplers, a lock releasing member, a rotatable shaft, a bearing support in which the shaft is journaled adjacent one end thereof, the other end of the shaft being free to partake of translatable movement in a direction transverse to the axis of the shaft, a flexible tensile member attached at one end to the shaft and at the other end to said lock releasing member and adapted to be wound upon said shaft upon rotation thereof to actuate said lock releasing member, and cooperating means including another tensile member adapted to be wound upon another portion of said shaft and extending between the shaft and a fixed part, the relation being such that rotation of the shaft causes one end of the

shaft to swing in a direction serving to retard the lock releasing action.

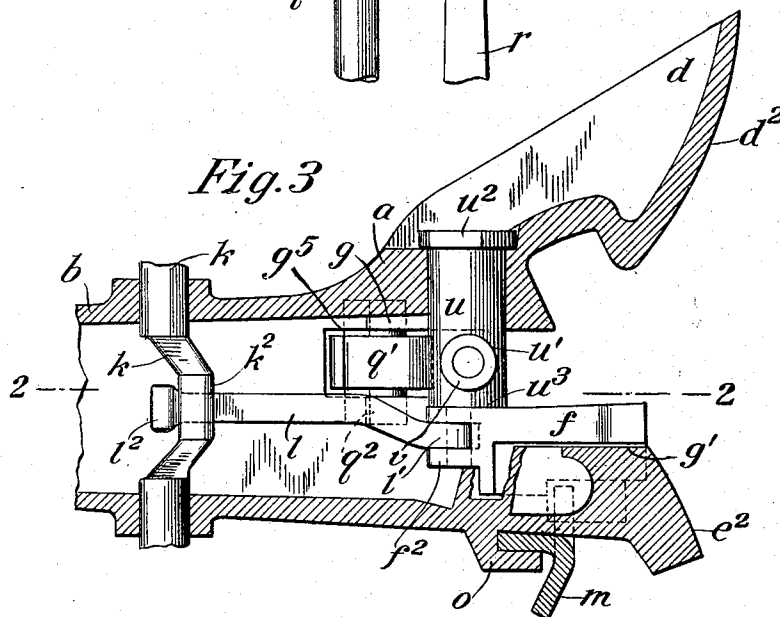
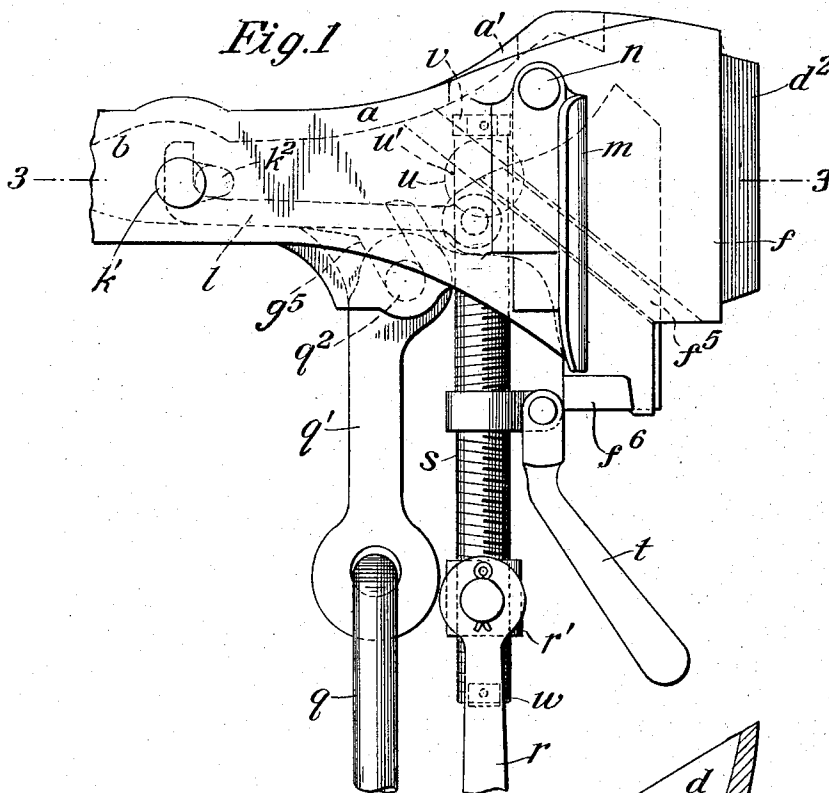
12. In an uncoupling mechanism for car couplers, a lock releasing member, a rotatable shaft mounted for bodily movement in a direction transverse to its axis, a flexible tensile member attached at one end to the shaft and at the other end to said lock releasing member, and cooperating means between the shaft and a part rigid with the car structure, said means being adapted, upon rotation of said shaft to actuate said lock releasing member, to enable a bodily movement of the shaft in a direction to partly offset the effect of the rotation of the shaft in producing the lock releasing action.

JOHN WILLISON.

AUTOMATIC CAR COUPLING.

1,201,668.

2 SHEETS—SHEET 1.



Witnesses:
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F. M. Winters.

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By his Attorney
Clarence Spence

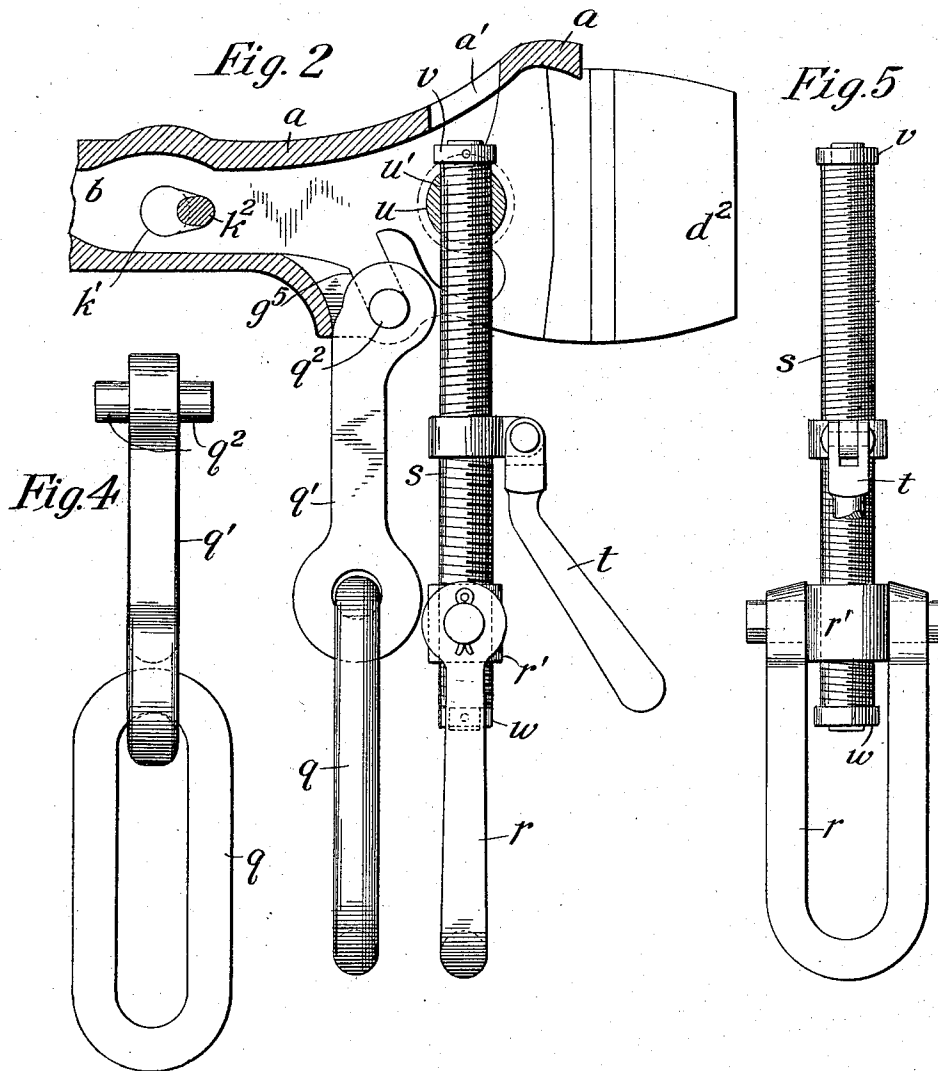
J. WILLISON.
AUTOMATIC CAR COUPLING.

APPLICATION FILED DEC. 31, 1913. RENEWED AUG. 10, 1916.

1,201,668.

Patented Oct. 17, 1916.

2 SHEETS—SHEET 2.



Witnesses:
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UNITED STATES PATENT OFFICE.

JOHN WILLISON, OF DERBY, ENGLAND, ASSIGNOR TO THE NATIONAL MALLEABLE CASTINGS COMPANY, OF CLEVELAND, OHIO.

AUTOMATIC CAR-COUPLING.

1,201,668.

Specification of Letters Patent.

Patented Oct. 17, 1916.

Application filed December 31, 1913, Serial No. 809,603. Renewed August 10, 1916. Serial No. 114,295.

To all whom it may concern:

Be it known that I, JOHN WILLISON, a subject of the King of Great Britain, and a resident of Derby, county of Derby, England, have invented new and useful Improvements in Automatic Car-Couplings, of which the following is a specification.

This invention relates to automatic car couplers of the kind described in my co-pending application, Serial No. 114,292, filed August 10, 1916, and it consists in improvements having for object to furnish such a coupler with a safety coupling chain and with a screw coupling device so that a car provided with the improved coupler may be coupled to cars that have ordinary draw hook couplings.

The invention will be explained with reference to the accompanying drawings, wherein it is shown, by way of example, as applied to the automatic coupler described in my co-pending application Serial No. 114,294, filed Aug. 10, 1916, which is an improvement on the coupler shown in the previously cited specification.

In the drawings, Figure 1 is an elevation of the improved coupler showing the safety coupling and the screw coupling device in the positions they occupy when not in use, Fig. 2 is a longitudinal section on line 2—2 of Fig. 3, Fig. 3 a sectional plan on line 3—3 of Fig. 1; Fig. 4 a front view of the safety coupling and Fig. 5 a similar view of the screw coupling device.

In the drawings the parts of the coupler head of the locking block and of the lock set device which are herein referred to and correspond to similar parts shown and described in the above cited specifications have the same reference characters applied to them as in those specifications and therefore need no further explanation now.

In the accompanying drawings, the safety coupling chain is shown as comprising a link q carried by one end of an arm q' which at its other end is provided with a pair of trunnions q^2 mounted to rock in open bearings q^5 formed on the side walls of the locking block recess g of the coupler head a . The openings or mouths to the bearings q^5 are upwardly directed.

The screw coupling device comprises the shackle r swiveled to the nut r' cooperating with the screwed rod s , to which is attached

the operating handle t of suitable form. The rod s is adapted for screwing through the threaded aperture u' of a pin u rotatably mounted in a side wall of the coupler head. The pin u has an enlarged head u^2 and has a length such that the face u^3 of its inner end will when the pin is in proper position act as a guide to the locking block f in its to and fro movements. The position of the aperture u' is such that when the several parts of the coupling are assembled, with the end of the pin u acting as a guide to the locking block and the pin head u^2 seated against the outer face of the wall of the coupler head, then the side of the screwed rod s , threaded through the aperture u' , will be in contact with the inner face of the said wall, or very nearly so. In this way, the pin cannot move in either direction longitudinally and is thus retained by the pin head and the screwed rod in proper working position.

In the top wall or roof of the recess in the coupler head is a hole a' for use in the operation of assembling the parts of the coupler. The position of this hole is such that when the pin u is turned for the purpose its aperture u' can be brought into coaxial relation with the hole a' . The hole a' is sufficiently large to allow the end of the screwed rod to pass through in order that a collar v may be affixed to the end and the rod and collar then withdrawn within the coupler-head. The collar v is for the purpose of preventing the corresponding end of rod s being withdrawn through the aperture of pin u in order that the screw coupling may remain suspended from the pin u . A similar collar w is fixed to the other end of the rod s in usual manner to prevent the rod being withdrawn completely through the nut r' while the screw rod s is being turned by means of the handle t in order to slacken the coupling between two cars.

The operation of assembling the several parts of the automatic coupling and its accessories is effected as follows:—The trunnions q^2 of the safety coupling are first mounted in the bearings q^5 . The pin u having been passed through the side wall of the coupler head, the rod s before or after the nut r' with its shackle r has been screwed on to its end, is then threaded through the aperture of the pin u to such

extent that its end, after the pin *u* has been suitably turned for the purpose, projects through the aperture *a'* in order that the collar *v* may be fixed thereon. This done
5 the rod with its collar is drawn within the coupler head to its full extent, that is until the collar *v* engages the pin *u*.

The bearings *g*⁵ are so shaped and formed that when the screw coupling device has
10 been threaded through the pin *u*, will serve to prevent the withdrawal of the safety coupling from the bearings *g*⁵.

The locking block *f* together with the mechanism *k, l* for operating same and the
15 lock set device *m* can now be mounted in operative position.

Having thus described the nature of my said invention and the best means I know
20 of carrying the same into practical effect, I claim:—

1. In an automatic coupler of the vertical plane type comprising a coupler head having a gravity-actuated lock mounted in a cavity thereof for normal intercoupling operations, a screw coupling device mounted
25 in said cavity and bearing against the lock, said device being comprised of a trunnion mounted in said cavity, a rod having a threaded engagement with said trunnion
30 and with a connection for a coupling link,

the said screw coupling device hanging normally below the coupler head.

2. In a car coupler of the vertical plane type, a coupler head having a cavity therein, a gravity-actuated lock mounted in said
35 cavity, and a screw coupling device mounted on a trunnion in said cavity, the said screw coupling device being adapted to depend from said trunnion vertically when in operative position and to be rotated about said
40 trunnion into horizontal position for connection with an opposing car.

3. In a car coupler of the vertical plane type, a coupler head having a cavity therein, a gravity-actuated locking block operating
45 in said cavity, and a screw coupling device mounted on a trunnion in said cavity and comprising a threaded rod having a threaded engagement with said trunnion
50 and with a connection for a coupling chain, a recess in said cavity for reception of a link of a supplemental chain, the said screw coupling device and supplemental chain being adapted to hang loosely from the coupler head when in inoperative position.

JOHN WILLISON.

Witnesses:

JOSEPH MILLARD,
W. I. SKERTEN.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."

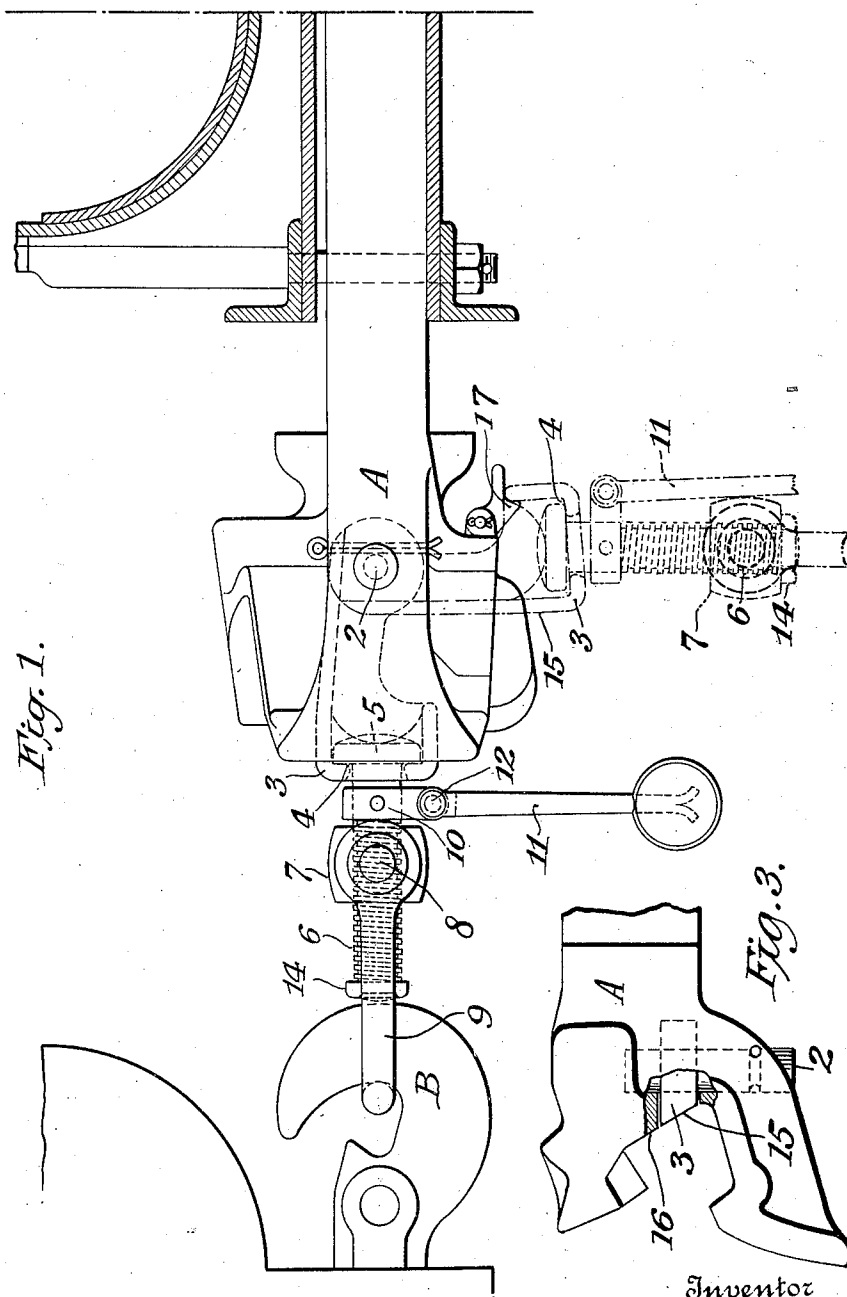
Jan. 18, 1927.

J. WILLISON

1,614,513

TRANSITION DEVICE FOR CAR COUPLERS

Original Filed March 7, 1922 2 Sheets-Sheet 1



Inventor
John Willison
By his Attorney
Clarence Kerr

Jan. 18, 1927.

J. WILLISON

1,614,513

TRANSITION DEVICE FOR CAR COUPLERS

Original Filed March 7, 1922 2 Sheets-Sheet 2

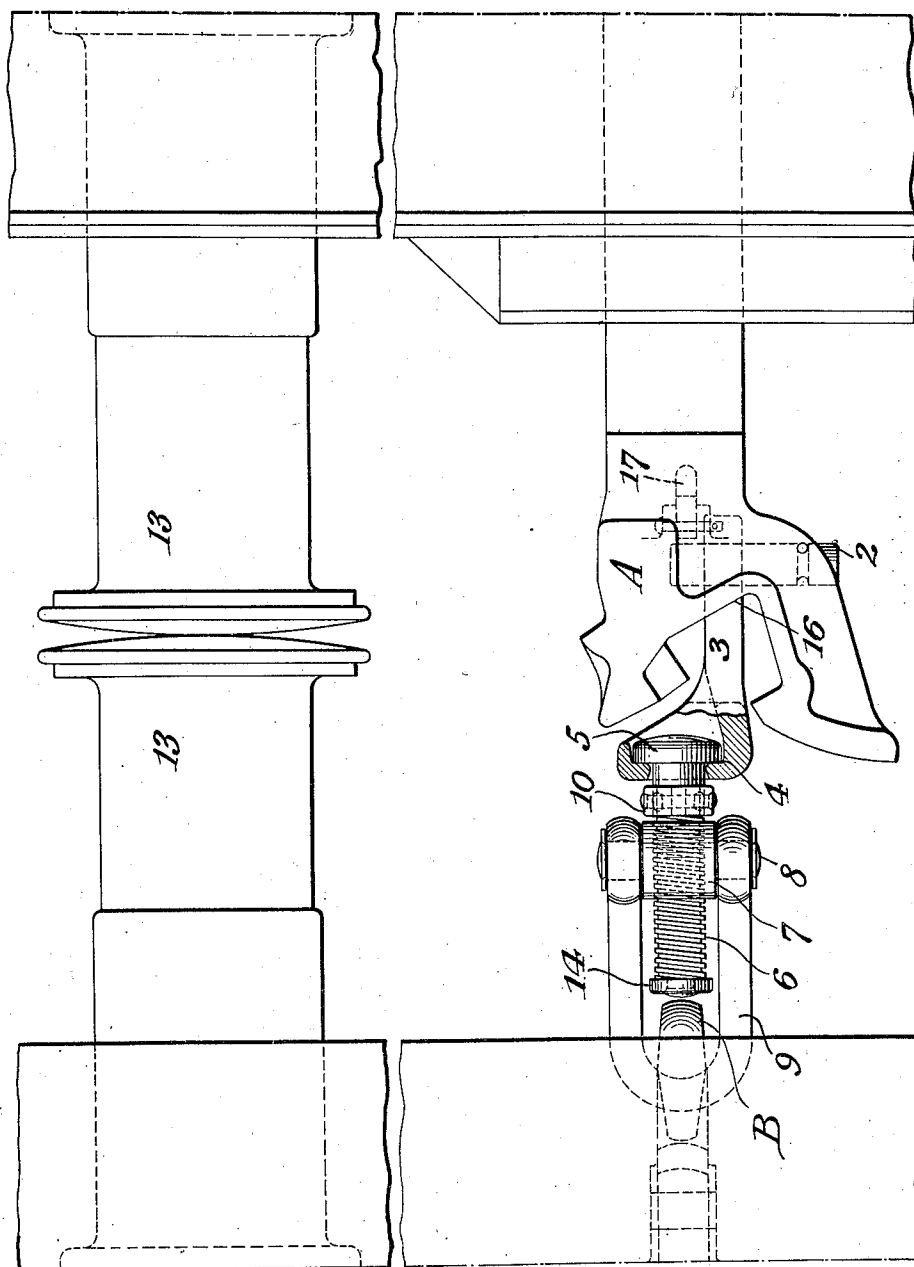


Fig. 2.

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By his Attorney

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UNITED STATES PATENT OFFICE.

JOHN WILLISON, OF CLEVELAND, OHIO, ASSIGNOR, BY MESNE ASSIGNMENTS, TO
NATIONAL MALLEABLE AND STEEL CASTINGS COMPANY, OF CLEVELAND, OHIO, A
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TRANSITION DEVICE FOR CAR COUPLERS.

Application filed March 7, 1922, Serial No. 541,758. Renewed June 1, 1926.

Fig. 1 is an elevation of my improved transition device; Fig. 2 is a plan thereof; and Fig. 3 is a detail of the contour face of the coupler to which the transition device is attached.

tion device, until the buffers are in contact, as is shown in Fig. 2.

My invention relates particularly to transitional coupling mechanism and is designed to provide means for permitting car couplers to be coupled with cars equipped with couplers of other types, such as of draw hook connection type. To this end I have provided a transitional or supplemental coupling device which can be carried by the automatic coupler and may be easily brought into and out of operative position, so that the coupler may be ready for coupling with an automatic coupler of the same type or with a draw hook arrangement, or any other form of car coupler. My improved device is also equipped with adjusting means whereby the effective over all length of the transitional device may be varied to take up slack between the cars. My invention also consists in the various features which I shall hereinafter describe and claim.

Referring to the drawings, A indicates a coupler of the automatic type and B a coupler of the draw hook type. Pivottally hung from a pin 2 mounted in the coupler head A is a draft member 3. The draft member at its forward end terminates in a socket 4 within which seats the head 5 of an outwardly extending screw member 6. Threaded upon the screw member 6 is a nut 7 provided with trunnion extensions 8 which extend through the eyes of a clevis or shackle 9. Rigidly attached to the screw member 6 between its head 5 and its screw portion is a collar 10, from which a weighted handle 11 hangs by the pivot 12. 13 are the buffers which maintain the cars a predetermined distance apart.

When a coupling is desired between couplers of different types, as between the coupler A and the coupler B, the transitional device (which when not in use hangs in the dotted line position shown in Fig. 1) is swung up and the shackle 9 is hooked over the hook of the coupler B. The handle 11 is then rotated to screw up the nut 7 to the right, as shown in Fig. 1, thus shortening the effective over all length of the tran-

In order to uncouple, the screw is turned by means of the weighted handle 11 in the reverse direction until the nut 7 is run out against the collar 14 on the outer end of the screw member 6, the round head at the opposite end of the screw permitting turning in the socket 4. This gives sufficient slack so that the shackle can be raised up over the point of the draw hook B. The whole device then swings down about the pivot 2 into inoperative position underneath the coupler, as is shown in dotted lines in Fig. 1. When in this position the forward face 15 of the draft member 3 lies flush with the contour face 16 of the coupler, the face 15 being formed so as to match the contour face 16 of the coupler, as is shown in Fig. 3. When in this inoperative position the handle 11 swings about its pivot 12 by which it is attached to the collar 10, so as to hang down in a more or less vertical position, and the device may be held in this position by means of a latch 17 which engages the inner edge of the socket portion 4 of the draft member 3. This latch 17 merely keeps the transitional device from swinging forward from inoperative position and interfering with an opposing coupler when of like type.

The terms and expressions which I have employed are used as terms of description and not of limitation, and I have no intention, in the use of such terms and expressions, of excluding any mechanical equivalents of the features shown and described, or portions thereof, but recognize that various structural modifications are possible within the scope of the invention claimed.

What I claim is:

1. Transitional coupling mechanism for coupling together couplers of different types, comprising a draft member pivottally connected to one of said couplers and arranged to swing freely in a vertical plane, a bail member and means connecting said members whereby their effective length may be varied; said draft member when in use extending forwardly between the jaws of said coupler and being maintained in a position out of the vertical only by its connection with the opposing coupler, said draft mem-

ber being freely movable from an operative to a non-operating position to allow said car coupler without alteration of parts to couple with a similar coupler.

- 5 2. Transitional coupling mechanism for coupling together couplers of different types, comprising a draft member pivotally connected to one of said couplers and arranged to swing freely in a vertical plane, the said

coupler having a buffing face and a slot extending longitudinally and rearwardly from the buffing face within which the draft member is pivoted, the draft member having means for closing the forward end of said slot when the coupler is used for like-to-
15 like coupling and the member is in non-operating position.

JOHN WILLISON.

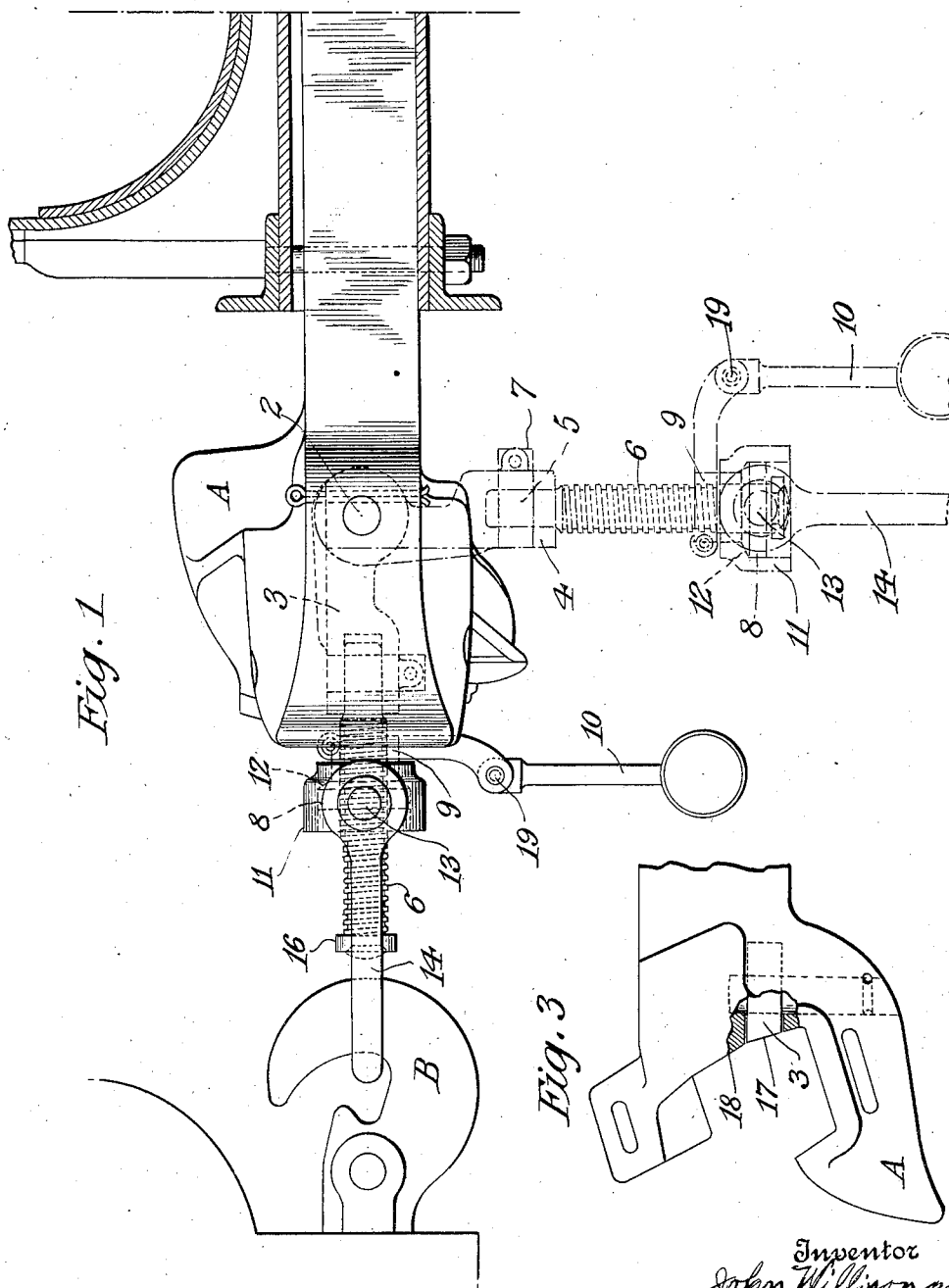
Jan. 18, 1927.

J. WILLISON ET AL

1,614,514

TRANSITION DEVICE FOR CAR COUPLERS

Original Filed Sept. 11, 1922 2 Sheets-Sheet 1



Inventor
John Willison and
David Robinson
By their Attorney
Clarence D. Fene

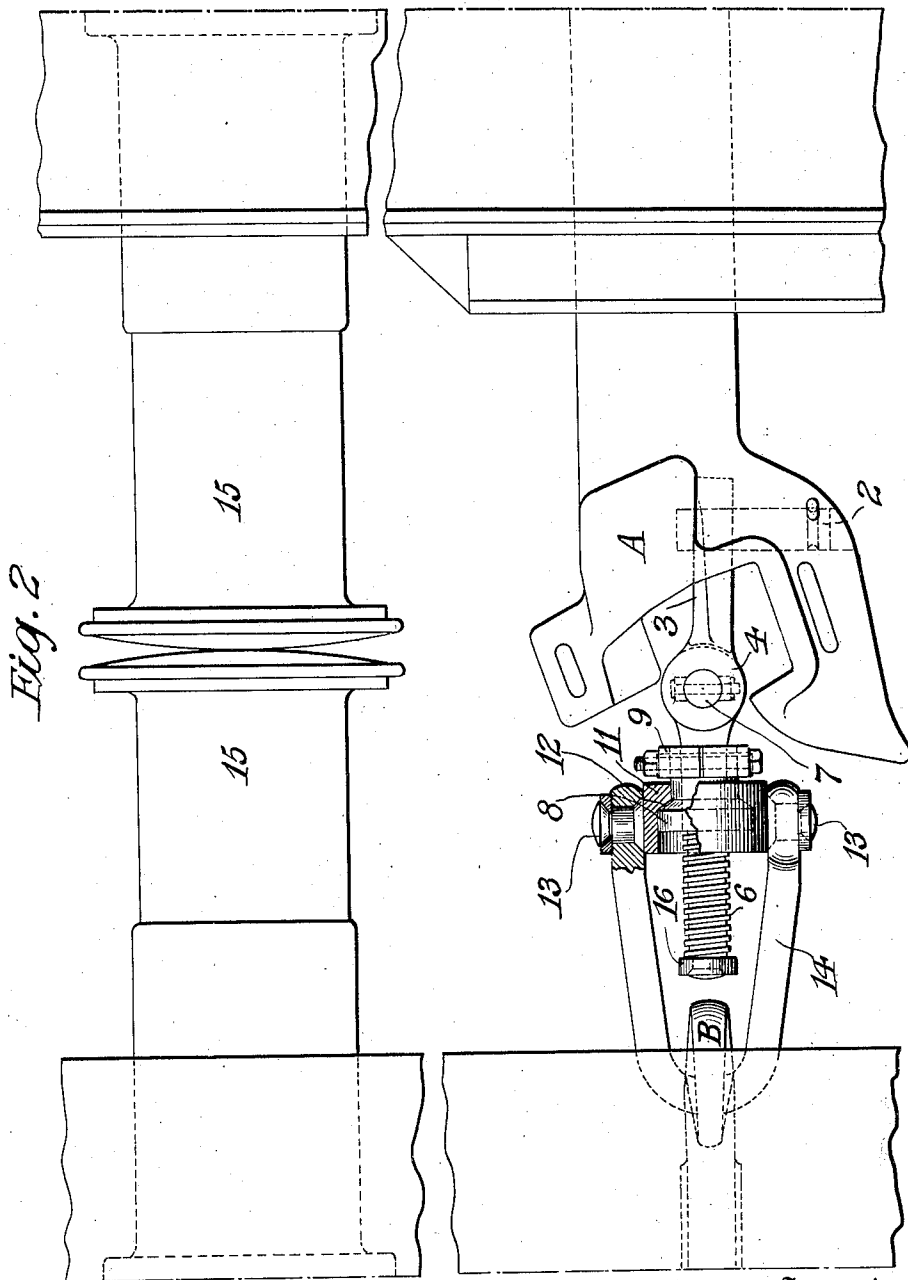
Jan. 18, 1927.

1,614,514

J. WILLISON ET AL

TRANSITION DEVICE FOR CAR COUPLERS

Original Filed Sept. 11, 1922 2 Sheets-Sheet 2



Inventor
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By this Attorney
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UNITED STATES PATENT OFFICE.

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TRANSITION DEVICE FOR CAR COUPLERS.

Application filed September 11, 1922, Serial No. 537,293. Renewed June 1, 1926.

Fig. 1 is an elevation of our improved transition device; Fig. 2 is a plan thereof; and Fig. 3 is a detail plan of the contour face of the coupler to which the transition device is attached.

Our invention relates particularly to improvements in transitional coupling mechanism and is designed to provide means for permitting automatic car couplers to be coupled with cars equipped with couplers of other types, such as of the draw hook connection type. We provide a transitional or supplemental coupling device which can be carried by the automatic coupler and may be easily brought into and out of operative position, so that the coupler may be ready for coupling with an automatic coupler of the same type or with a draw hook arrangement or any other similar form of car coupler. Our improved device is equipped with adjusting means whereby the effective overall length of the transitional device may be varied to a large extent for ease in coupling and uncoupling and to take up the slack between the cars. Our invention also consists in the various features which we shall hereinafter describe and claim.

Referring to the drawings, A indicates a coupler of the automatic type and B a coupler of the draw hook type. Pivottally hung from a pin 2 mounted in the coupler head A is a draft member 3. The draft member 3 at its forward end terminates in jaws 4, between which the apertured end 5 of a screw member 6 is pivottally secured by means of pin 7. Threaded upon the screw member 6 is a nut 8 about whose extension 9 is rigidly clamped an operating handle 10. Taking about the nut 8 is a collar 11 having a shouldered engagement at 12 with nut 8, which provides a pulling bearing and at the same time leaves the nut free to turn within the collar 11. The collar 11 is provided with trunnion extensions 13 which extend through the eyes of a clevis or shackle 14. 15 are the buffers which maintain the cars a predetermined distance apart.

When it is desired to couple cars provided with couplers of different types, as the coupler A and coupler B, the transitional device (which when not in use depends vertically from the pin 2 in the dotted line position shown in Fig. 1) is swung up

and the shackle 14 is hooked over the hook of the coupler B. Then in order to take up the slack between the cars the handle 10 is rotated to screw the nut 8 to the right along the screw member 6, as shown in Fig. 1, which carries with it collar 11 by reason of its shoulder engagement at 12, thus shortening the effective over-all length of the transition device, until the buffers 15 are in contact as shown in Fig. 2.

In order to uncouple, the handle 10 is rotated to screw the nut 8 to the left along the screw member 6, thereby increasing the length of the device between the member 3 and the shackle 14. Sufficient slack is thus secured to raise the shackle up over the point of the draw hook B, thereby uncoupling the cars. By reason of the arrangement of nut 8 and collar 11 which surrounds the nut, it is possible to increase the effective length of the device to a considerable extent, as the nut may be turned out along the screw 6 until it comes up against the face of stop 16 on the end of the screw member 6. This gives sufficient slack so that the shackle may easily be raised up over the point of the draw hook B. The whole device then swings down about the pivot 2 into inoperative position underneath the coupler, as is shown in dotted lines in Fig. 1. When in this position the then forward face 17 of the draft member 3 lies flush with, and forms a continuation of, the contour face 18 of the coupler, as is shown in Fig. 3. When the device is in inoperative position, the handle 10, by means of its pivot 19, hangs down in a vertical position.

We have found that our improved device gives ample clearance between the hook B and the end of the screw member 6 and at the same time provides sufficient travel of the nut along the screw by reason of the fact that the screw 6 and collar 11 have a telescopic engagement except when the screw is drawn as far as possible to the left.

The pivotal connection between the jaws 4 and the screw member 6 provides lateral flexibility between the coupler head A and screw member 6 which is of great advantage when the cars are being pulled around a curve.

The shoulder engagement of collar 11 and nut 8 whereby the collar is free to turn about the axis of screw member 6 is of great

advantage both in coupling operations and in providing flexibility in draft.

The terms and expressions which we have employed are used as terms of description and not of limitation, and we have no intention, in the use of such terms and expressions, of excluding any mechanical equivalents of the features shown and described, or portions thereof, but recognize that various structural modifications are possible within the scope of the invention claimed.

What we claim is:

1. A transitional coupling mechanism for coupling together couplers of different types, comprising a draft member pivoted to a car coupler for movement in a vertical plane, a screw shaft secured to the draft member by a laterally flexible connection, a shackle adapted to engage a coupler of the hook type, and a screw mechanism for varying the effective over-all length of the said coupling member, said coupling being freely movable from an operative to a non-operative position to allow said car coupler without addition or subtraction of parts to couple with a like-to-like coupler.

2. A transitional coupling mechanism for coupling together couplers of different types, comprising a draft member pivoted to a car coupler, a screw shaft pivotally secured to the draft member, a collar about the screw shaft carrying a shackle, a nut in engagement with said collar, and means for rotating

the nut to vary the effective over-all distance between the end of the shackle and the draft member to permit coupling and uncoupling operations with the shackle.

3. A transitional coupling mechanism for coupling together couplers of different types, a draft member pivoted to a car coupler, a screw member secured to the draft member and having a nut thereon, a collar and a shackle attached thereto, said collar having a telescopic engagement with said nut, and means for moving the said collar along the screw member to vary the effective over-all length of the device.

4. A transitional coupling mechanism for coupling together couplers of different types, a draft member, a screw member secured to the draft member and having a nut thereon, a collar carrying a shackle in engagement with said nut and being free to turn about the axis of the screw member, and means for moving the collar along the screw member to vary the effective over-all length of the device.

5. A transitional coupling mechanism for coupling together couplers of different types comprising a shackle carrying a collar, a screw member, and a nut for operatively connecting said collar to said screw member, and means for attaching said screw member to said coupler.

JOHN WILLISON.
DAVID ROBINSON.

Feb. 17, 1925.

1,526,689

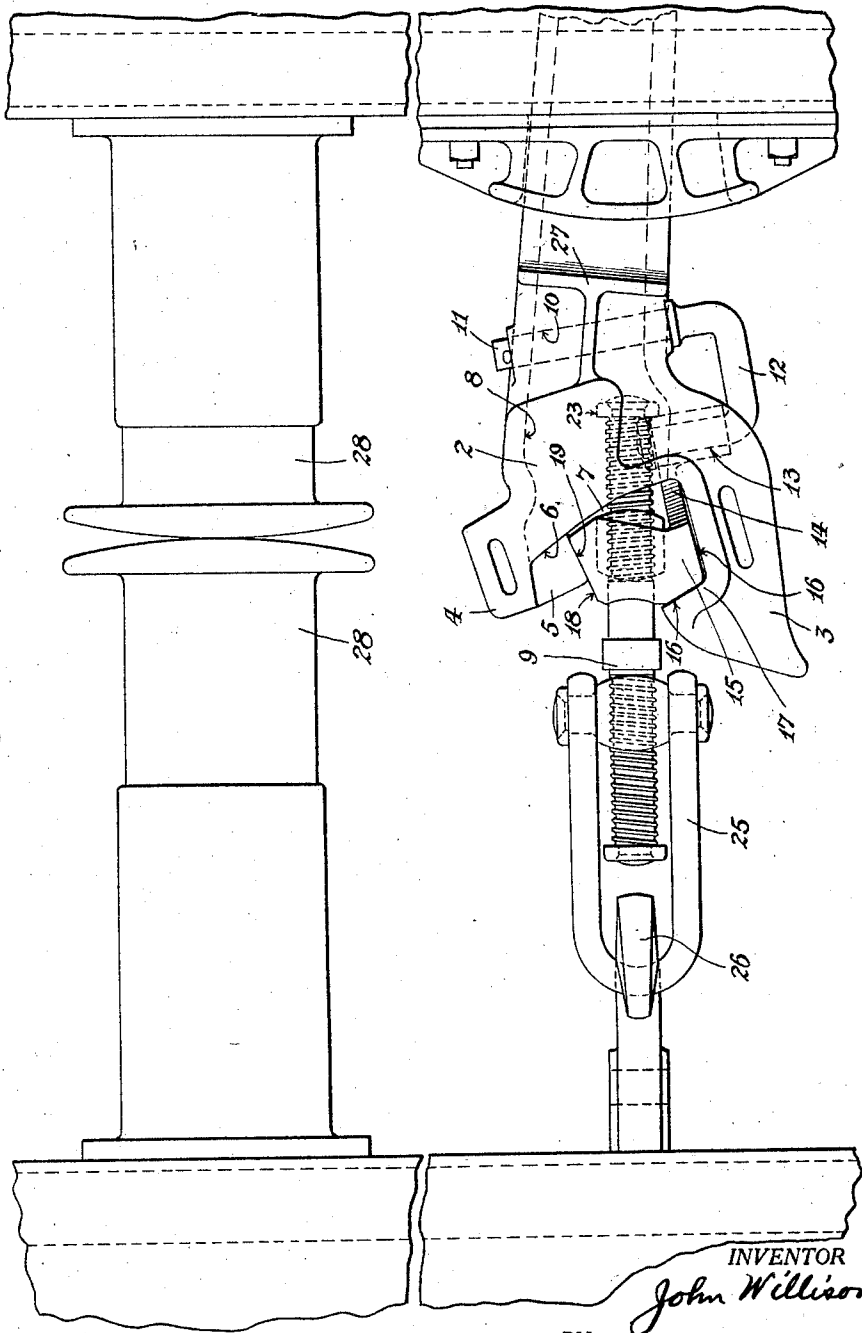
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TRANSITION DEVICE FOR CAR COUPLERS

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Fig. 1.



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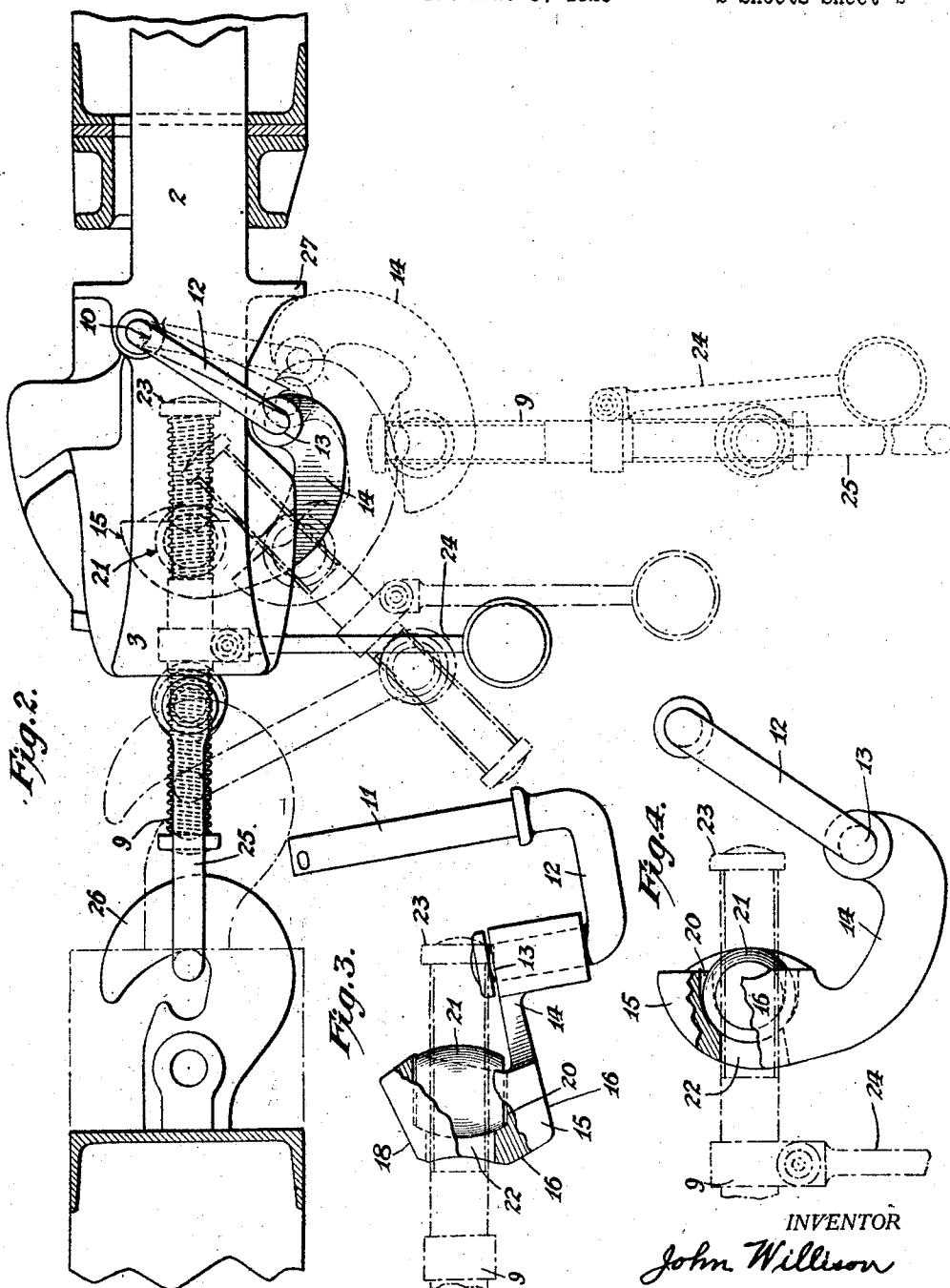
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TRANSITION DEVICE FOR CAR COUPLERS

Filed June 9, 1923

2 Sheets-Sheet 2



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TRANSITION DEVICE FOR CAR COUPLERS.

Application filed June 9, 1923. Serial No. 644,330.

To all whom it may concern:

Be it known that I, JOHN WILLISON, a subject of the King of Great Britain, residing at Cleveland, Cuyahoga County, Ohio, have invented new and useful Improvements in Transition Devices for Car Couplers, of which the following is a specification, reference being had to the accompanying drawings, in which--

Fig. 1 is a plan of a car coupler having my improved device attached thereto coupled with a coupler of the draw-hook type and showing the position of the couplers when under draft; Fig. 2 is an elevation thereof showing in full lines the position of the transition device and the couplers when under draft, in dot-dash lines, the position of such mechanism when the cars are buffed together, and in dotted lines the position of the transition device when not in use; Fig. 3 is a detail plan of a portion of the transition device, and Fig. 4 is a side elevation thereof.

My invention relates to transitional coupling mechanism and is particularly designed to provide means for permitting cars equipped with automatic couplers to be coupled with cars equipped with couplers of other types, such as of the draw-hook and side buffer type. To this end I have provided a transitional or supplemental coupling device which can be carried by the automatic coupler and may be easily swung into and out of operative position so that the coupler may be ready for coupling with an automatic coupler of the same type or with a draw-hook arrangement or other form of coupler. My improved mechanism is arranged to be supported beneath the coupler head when not in use and to be swung between the jaws of the coupler into operative position, and is to be connected with a coupler of the draw-hook or other type by a device such as a screw coupling member. My invention also consists in the various features which I shall hereinafter describe and claim.

Referring to the drawings, 2 indicates a coupler of the rigid jaw type shown in my United States Patent No. 1,201,665, dated October 17, 1916, having jaws 3 and 4 and a lock 5 normally projecting forward of the intermediate buffing face 6 of the car coupler. The coupler in addition to the cavity 8 in which the lock 5 operates has a recess 7

extending rearwardly from the buffing face 6 near the axis of the coupler to admit the rear end of the screw coupling member 9 thereinto when the transitional member is under draft tension.

The coupler 2 to the rear of its head has a transversely extending horizontal aperture 10 which forms a bearing for the arm 11 of the transitional supporting member 12. The support 12, which is shaped somewhat like the letter J, extends downwardly and forwardly and has a portion 13, which returns under the coupler 2 and has pivotally mounted upon it the carrier 14, the upper end of which terminates in a draft arm 15. The draft arm 15 has angled faces 16 which bear in the crotch 17 of the jaw 3, while its opposite face 18 is intended to bear against the side face 19 of the lock 5 when in operative position.

The draft arm 15 has formed on its rear side a socket 20 for the threaded nut 21, which is rotatably mounted therein on its horizontal axis. The draft arm 15 is also apertured at 22 on its forward side to permit insertion of the screw coupling member 9 through the draft arm 15 and into the threaded nut 21. When the member 9 has been so inserted a washer 23 may be riveted to the end of the screw 9 to keep it from being turned completely out of the threaded nut 21.

The screw coupling member 9 has attached thereto the usual operating handle 24 and shackle 25 by which a coupling may be effected with a coupler of another type, such as the draw-hook 26.

When the transitional member is not in use it depends beneath the coupler from its arm 11 out of the way of any coupling operations, as is shown in dotted lines in Fig. 2, and is held from swinging loosely thereunder by the forward side of the buffing flange 27, against which it is normally held in bearing by gravity. When it is desired to use the transitional device with a coupler of the draw-hook type, the device is swung forward and upwardly and the shackle 25 passed over the hook 26 of the opposing coupler. The screw handle 24 is then rotated to take up the slack in the transitional member, which brings the draft arm 15 into bearing between the jaw 3 and the lock 5 of the coupler 2, and the

buffers 28 under a slight initial stress, as is shown in Fig. 1.

When under draft the pulling stresses are transmitted from the hook 26 to the shackle 25, and then through the screw member 9 and nut 21 to the draft arm 15, and through that arm to the pulling jaw 3 and lock 5. When the cars approach each other in buffing the resulting slack permits the transitional device to drop down out of the way of the hook 26, as is shown in dot-dash lines in Fig. 2, so that it will not be damaged in buffing.

My improved transition mechanism provides an extremely simple and rugged connection which utilizes screw connections and couplers of existing form and hence provides an extremely economical arrangement for transition service.

The terms and expressions which I have employed are used as terms of description and not of limitation, and I have no intention, in the use of such terms and expressions, of excluding any mechanical equivalents of the features shown and described, or portions thereof, but recognize that various structural modifications are possible within the scope of the invention claimed.

What I claim is:

1. In coupler mechanism, the combination with an automatic coupler of a supplemental coupling member pivoted to the coupler and depending therefrom when in lowered position, and when in operative position having an extension terminating in a draft arm engaging pulling faces of

said coupler, said draft arm also supporting a screw and shackle connection for coupling with a coupler of a different type.

2. In a coupler mechanism, the combination with an automatic coupler of a supplemental coupling member pivotally mounted on the coupler head and having a draft arm, the draft arm having on one side a pulling bearing on the pulling jaw of the coupler and on the other a bearing from which pulling strains are transmitted to the coupler, and an extensible and contractable coupling member mounted on the draft arm for connection with a coupler of a different type.

3. In coupler mechanism, the combination with an automatic coupler of a supplemental coupling member pivotally mounted on the coupler and having a draft arm having pulling bearings on the coupler, a rotative bearing carried by the draft arm having mounted therein a member capable of movement relative to the draft arm to provide and take up slack in a connection with another coupler.

4. In coupler mechanism, the combination with an automatic coupler of a supplemental coupling member pivotally mounted on the coupler and having a draft arm having pulling bearings on the coupler, a rotative bearing carried by the draft arm having mounted therein a screw member capable of axial movement relative to said bearing and carrying a shackle for connection with another coupler.

JOHN WILLISON.